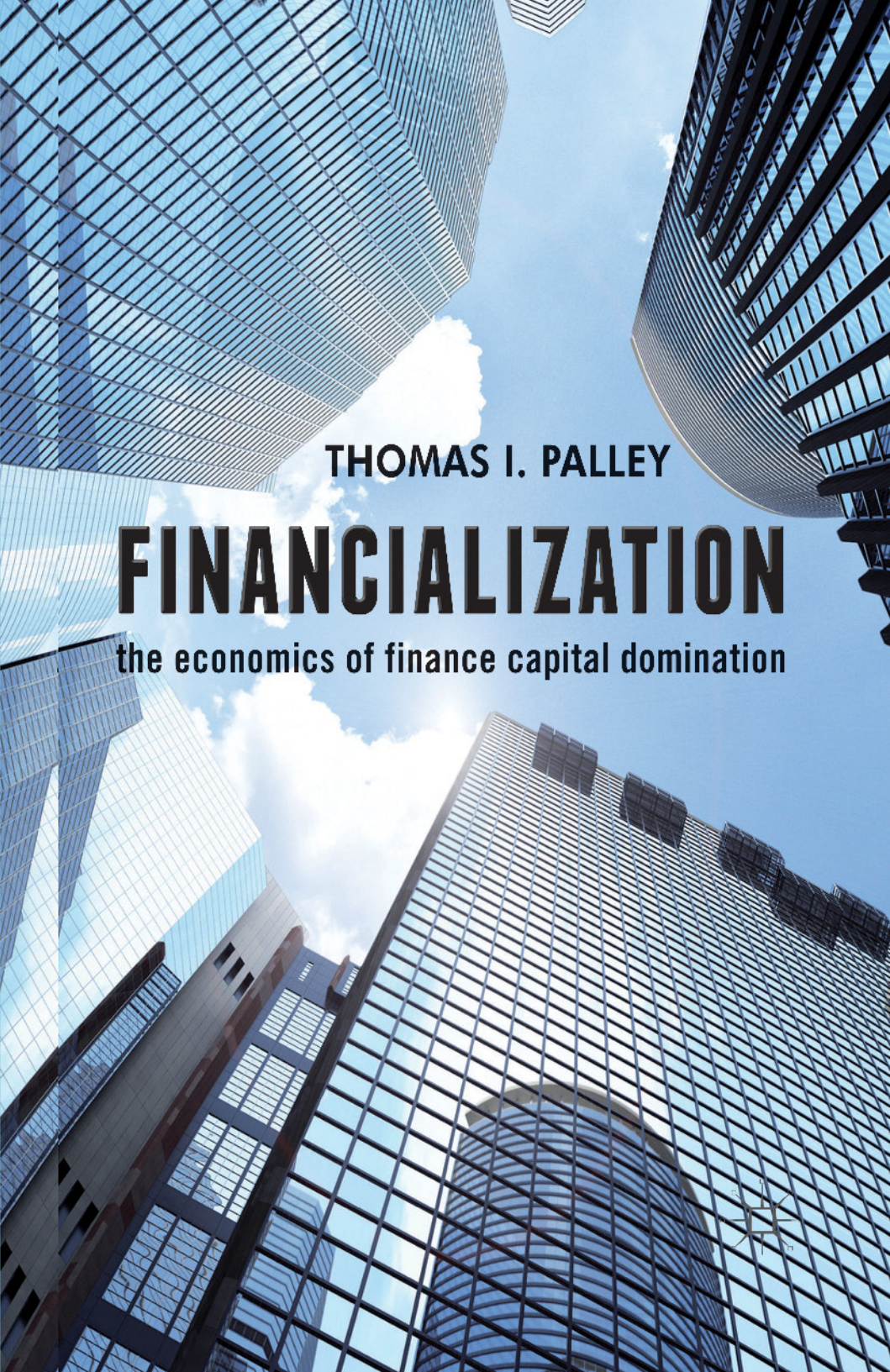
THOMAS I. PALLEY
FINANCIALIZATION
the economics of finance capital domination

Financialization

The Economics of Finance Capital Domination

Thomas I. Palley
Economic Policy Adviser, AFL-CIO, USA

palgrave
macmillan

2013

Contents

List of Figures vi

List of Tables viii

Acknowledgments ix

1 Overview: Financialization as Financial Neoliberalism 1

Part I The Macroeconomics of Financialization

2 Financialization: What It Is and Why It Matters 17

3 The Macroeconomics of Financialization: Stages of Development Approach 41

4 The Simple Analytics of Debt-driven Business Cycles 62

5 Deflation and Inflation Dynamics with Debt 82

Part II Financialization and Instability

6 Herd Behavior: Safety in Numbers 105

7 Short-termism: The Problem of Managerial Turnover 112

8 A Theory of Minsky Super-cycles and Financial Crises 126

Part III Financialization and Growth

9 Inside Debt and Economic Growth 145

Part IV Financialization and Policy

10 A Monetary Policy Framework for Asset Price Bubbles 165

11 Monetary Policy and Central Banking after the Crisis: The Implications of Rethinking Macroeconomic Theory 182

12 The Political Economy of Financialization 201

Notes 214

References 221

Index 231

Figures

1.1	Financialization and the distribution of income	5
1.2	The Keynesian era virtuous circle growth model	6
2.1	The role of finance in the process of financialization	19
2.2	Productivity and real average hourly wage and compensation of US non-supervisory workers (1947–2009)	26
2.3	Financialization and the functional distribution of income	27
2.4	Conduits of financialization	30
2.5	Non-financial corporation net equity issuance and new borrowing (1959–2006)	33
2.6	Non-financial corporation borrowing and net equity issuance as percentage of non-residential investment (1959–2006)	34
2.7	Economic policy and the neoliberal box	35
3.1	The channels of financialization	46
4.1	Channels via which debt impacts economic activity and causes business cycle	64
4.2	The predator–prey structure of the interaction between debt and income	65
5.1	Iso-AD contours	85
5.2	Graphical analysis of stability in conditions of excess supply and deflation	86
5.3	Graphical analysis of stability in conditions of excess supply and deflation	87
5.4	The effect of a lower price level in the ISLM model for the case when the Fisher debt effect dominates the combined Keynes and Pigou effects	90
5.5	Graphical analysis of instability of deflation due to dominance of the Fisher debt effect	92
5.6	Graphical analysis of instability of inflation due to dominance of the Fisher debt effect	93
6.1	Response functions of managers I and II showing their investment choices as a function of the others	109
7.1	Determination of the critical quit probability at which risk-neutral managers become short-termist	120
8.1	The two cycles embedded in the financial instability hypothesis	128
8.2	Stages of the Minsky basic cycle	129

8.3	Stages of the Minsky super-cycle	131
8.4	A symmetric Minsky super-cycle	132
8.5	An asymmetric Minsky super-cycle	133
8.6	Details of the Minsky super-cycle	134
8.7	The changing pattern of risk and risk-taking	137
9.1	Determination of equilibrium profit share and capacity utilization in the wage-led case	151
10.1	The new consensus model of monetary policy	167
10.2	Determination of the central bank's policy interest rate and the loan market rate	169
10.3	Asset bubbles and central banks' model	169
10.4	The post-bubble trap	173
10.5	Comparison of alternative forms of balance sheet regulation	175
11.1	A program to reform the Federal Reserve	185
11.2	Monetary policy reform	191
11.3	The backward bending Phillips curve	192
11.4	Main causes of the financial crisis	198
12.1	The political economy triangle	202
12.2	The Keynesian era virtuous circle growth model	203
12.3	The neoliberal policy box	203
12.4	Lifting the lid and unpacking the box	204
12.5	The mechanics of financialization	204
12.6	The structural Keynesian policy box	208
12.7	The political dilemma posed by neoliberalism	209

Tables

2.1	GDP growth in selected countries and regions (% based on 2005 market prices)	18
2.2	Per person employed GDP growth in selected countries and regions (% based on 2005 market prices)	18
2.3	U.S. gross credit market debt outstanding (1973–2010)	22
2.4	Sector decomposition of gross U.S. non-financial debt	23
2.5	Decomposition of U.S. gross domestic non-financial debt by type of debt	24
2.6	Decomposition of U.S. gross domestic non-financial debt by sector	24
2.7	GDP share of the FIRE sector	25
2.8	Employment share of the FIRE sector	26
2.9	Capital's share of national income relative to labor's	28
2.10	Profits relative to interest payments	28
2.11	Decomposition of private sector corporate profits into financial and non-financial sectors	29
2.12	Corporate sector profit rates.	35
2.13	Publicly held government debt and government interest payments	37
7.1	The time sequence of project returns	117
9.1	Conditions describing profit-led, wage-led, and conflictive regimes	150
9.2	Comparative statics for a wage-led regime	152
9.3	Comparative statics with endogenous debt	155

Acknowledgments

I would like to thank my wife Margarita Cereijido for her love and support. Without her, each day, it would be much harder to stand up and confront the misleading ideas of economic orthodoxy that dominate textbooks, fill the media, and occupy the minds of economists and policymakers.

I would also like to thank Gemma Shields at Palgrave Macmillan for shepherding my book through to publication, the production team at Newgen Knowledge Works for their typesetting and production of the book, and the following for permission to use material I have previously published:

Contributions to Political Economy: "A theory of Minsky super-cycles and financial crises" (2011).

Eastern Economic Journal: "Inside debt and the stability of inflation" (2011).

Edward Elgar: "Inside debt and economic growth: a Cambridge-Kaleckian analysis," in Setterfield (ed.), *The Alternative Handbook of Economic Growth* (2010).

Ekonomiaz Revista Vasca de Economia: "The macroeconomics of financialization: a stages of development approach" (2009).

Intervention: European Journal of Economics and Economic Policies: "Asset price bubbles and monetary policy: why central banks have been wrong and what should be done" (2010).

Journal of Economic Behavior and Organization: "Keynesian models of deflation and depression revisited" (2008), "Safety in numbers: a model of managerial herd behavior" (1995), and "Managerial turnover and the theory of short-termism" (1997).

Metropolis-Verlag: "Financialization: what it is and why it matters," published in Hein, Niechoj, Spahn, and Truger (eds), *Finance-led Capitalism: Macroeconomic Effects of Changes in the Financial Sector* (2008), and "Macroeconomics after the bust: the outlook for economics and economic policy," published in Hein, van Treek, and Truger (eds), *Macroeconomic Policies on Shaky Foundations: Whither Mainstream Economics?* (2009).

Oxford University Press: "Monetary policy and central banking after the crisis: the implications of rethinking macroeconomic theory," in Epstein and Wolfson (eds), *The Handbook on Political Economy of Financial Crises* (2013).

1
Overview: Financialization as Financial Neoliberalism

This book is about financialization, a term that has become popular to describe developments over the past 30 years within the global economy, and particularly within developed industrialized economies. Seen in that light, financialization represents the most recent stage of capitalist economic development.

Krippner (2004) provides a history of the term "financialization," and describes one definition as the dominance of the shareholder value model of corporate governance. Krippner (2005, p.174) also offers her own definition as "a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production." Epstein (2004, p.3) defines it as "the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies."

A simple alternative definition is that financialization corresponds to financial neoliberalism which is characterized by domination of the macro economy and economic policy by financial sector interests. According to this definition, financialization is a particular form of neoliberalism. That means neoliberalism is the driving force behind financialization and the latter cannot be understood without an understanding of the former.

1.1 Neoliberalism

Neoliberalism is both a political and economic philosophy (Palley, 2012; Chapter 2). As a political philosophy, it maintains that a *laissez-faire* deregulated market economy is the best way to promote individual freedom; as an economic philosophy, it maintains that a *laissez-faire*

deregulated market economy is the best way to promote economic efficiency and economic well-being.

In the language of economists, such market arrangements promote Pareto optimal outcomes in which it is impossible to make someone better off without making someone else worse off. The claim is that resources are used in a productively efficient way (that is, production takes place at minimum cost so that it is impossible to produce the existing output at existing prices using less input), and that all opportunities for mutually beneficial exchange are used so that no gains from trade are missed. Consequently, it is impossible to either reorganize production or change the pattern of exchange so as to make people better off. Note, this does not mean outcomes are fair. The actual outcome will depend on the initial distribution of resources, and if the initial distribution is unfair the final outcome will be unfair. The important point is that the final outcome cannot be improved upon without making someone worse off.

1.2 The special standing of financial markets in modern neoliberal economics

Neoliberalism elevates the standing of markets which are argued to coordinate economic activity in an optimal fashion. Moreover, market behavior is deemed applicable to almost all walks of life. Where markets exist, the presumption is they should be deregulated, and where markets do not exist they should be created if possible. The market is viewed as the pre-eminent institution of social organization and coordination.

Financialization (financial neoliberalism) singles out financial markets and gives them special elevated standing. First, financial markets are held up as the ideal market. The claim is financial markets clear continuously via rapid price adjustment and are stable, and financial prices embody all economically relevant available information.

Second, financial markets are given a special economic role regarding the allocation of saving; the promotion of capital accumulation; the reallocation and spreading of risk; and as an instrument of corporate control. With regard to the allocation of saving, financial markets transfer saving from surplus economic units (savers) to deficit units (borrowers). This is the traditional microeconomic interpretation of financial intermediation. In neoclassical macroeconomics this role is played by the loanable funds market. The transfer of savings to deficit spending units supposedly counters the Keynesian problem of deficient aggregate demand. Financial intermediation, performed by banks and the loanable funds market, therefore ensures full employment. It also increases growth by allocating

saving to those who will use the resources most productively and generate the highest returns. Furthermore, financial intermediation increases saving and investment as the higher returns earned from lending make saving more attractive.

Another way in which financial markets increase capital accumulation and income is through creation of liquid asset markets in which assets are readily traded and efficiently priced. The existence of liquid asset markets means that instead of holding unproductive money, economic agents can direct their income to the accumulation of productive assets that raise income and growth. They are more willing to accumulate capital in place of money because they know capital assets can, if needed, be readily sold and realized at reasonable values.

The existence of liquid asset markets in which assets can be readily transferred and sold at reasonable values also means that assets can more easily serve as collateral. Moreover, entrepreneurs are more willing to pledge assets as collateral because they are more confident that they will get a fair price should the collateral need to be realized. In this fashion, liquid asset markets effectively increase the supply of entrepreneurship, which also increases investment and growth.

Another function of financial markets is the reallocation and spreading of risk. One way of doing this is via insurance. Traditionally, insurance has focused on catastrophe insurance, but modern financial markets expand the scope of insurance through arrangements such as futures markets that enable producers to hedge income streams and input costs. The resulting ability to manage risk in turn makes producers more willing to undertake risky productive activity as they can purchase protection against the additional risk.

Catastrophe, income, and cost insurance have been the traditional risk management function of financial markets. However, taking the lead from Markowitz (1959) and Tobin (1958), modern neoclassical economics emphasizes wealth and income risk reduction via portfolio management. Liquid financial markets enable economic agents to buy financial assets with different risk–return properties. By appropriately combining assets (following the principle of "not putting all one's eggs in one basket") agents can form diversified portfolios that reduce risk. Such portfolio formation makes agents better off by reducing risk while holding expected returns constant. That in turn allows them to finance more productive risky assets relative to what they would be willing to do in a world without financial portfolios.

Adding new financial assets with different risk–return characteristics increases the opportunities for efficient portfolio formation. In terms of

the Arrow–Debreu (1954) state contingent general equilibrium model, adding new financial assets effectively plugs missing markets by making available income streams for state outcomes in which income could not previously be purchased. That expands the set of possible trades, and enables more risk diversification, again making agents better off. Such reasoning provides a rationalization for financial innovations that introduce new financial assets, and this rationalization has been invoked to justify the creation of financial assets such as mortgage-backed securities (MBS) and collateralized debt obligations (CDO). Such financial innovations also increase the liquidity (tradeability) of financial assets, increase the ability to collateralize assets, improve risk spreading, and increase the elasticity of finance for investment.

Lastly, financial markets provide an instrument of corporate control. Modern corporations are run by managers rather than shareholders, which creates a principal–agent problem. The core problem is that the managers (the agent) may not run the corporation in the best interests of the shareholders (the principal), by failing to maximize the net present value of the firm. Financial markets can provide a managerial discipline device by providing a market for control (Jensen and Meckling, 1976). Thus, where managers are falling short, activist investors can buy stock, acquire control of the firm, and replace the existing managers with other managers who run the firm in the best interests of shareholders. This is the basis of the shareholder value maximization model that Krippner (2004) defines as financialization.

1.3 The impact of financialization

The era of financialization has been marked by an enormous increase in the size of the financial sector. The economic justification for this expansion rests on the types of arguments presented above. The expansion of the financial sector has also been accompanied by significantly changed income distribution, and Figure 1.1 illustrates the pattern of change. Gross domestic product (GDP) can be decomposed into capital's and labor's share, and financialization has seen an increase (+) in capital's share and a decrease (−) in labor's share. Labor's share can in turn be decomposed into managers' share (salaries and other forms of compensation) and non-managers' share, and financialization has seen an increase (+) in managers' share and a decrease (−) in non-managers' share. Capital's share can be broken down into profits and interest income, and profits can be decomposed into financial sector and non-financial sector profits. In addition to seeing an increase in capital's

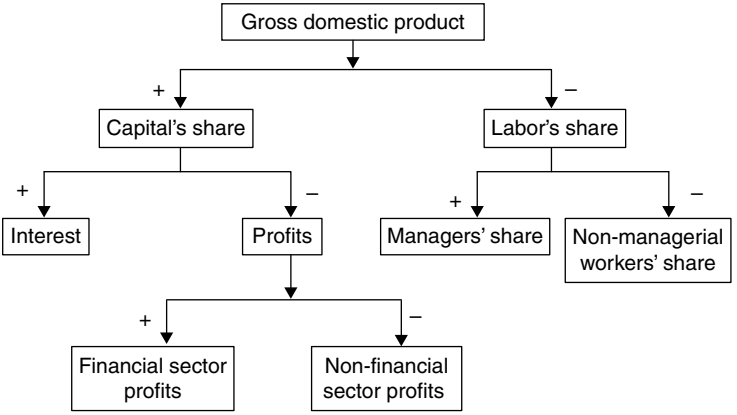

Figure 1.1 Financialization and the distribution of income

share and a decrease in labor's share, the era of financialization has also seen significant change in the composition of capital's share, with the profit share falling and the interest share rising. Furthermore, there has also been an increase in the financial sector's share of total profits and a decrease in the non-financial sector's share.

Neoliberalism is an ideology of elite interests, and it serves to shift economic power and income from labor to capital. Financialization reinforces this shift and further changes the distribution of income at a more disaggregated level by increasing the managers' share of the wage bill, increasing the share of interest income, and increasing the financial sector's share of profit income. These outcomes are the result of profound changes in the structure of the macro economy, and it is those changes which are the focus of this book.

The 30 years after World War II can be viewed as the era of Keynes. In the late 1970s economic policy turned in a neoliberal direction, and the triumph of neoliberalism is symbolized by the election victories of Mrs. Thatcher in the UK in 1979 and Ronald Reagan in the USA in 1980. The Keynesian era economic growth model can be characterized as a virtuous circle in which wage growth drove aggregate demand growth. The key features of the model were full employment combined with a wage system that tied wage growth to productivity growth. The logic was as follows. Productivity growth drove wage growth, which fuelled demand growth and created full employment. That provided an incentive for investment, which drove further productivity growth. This

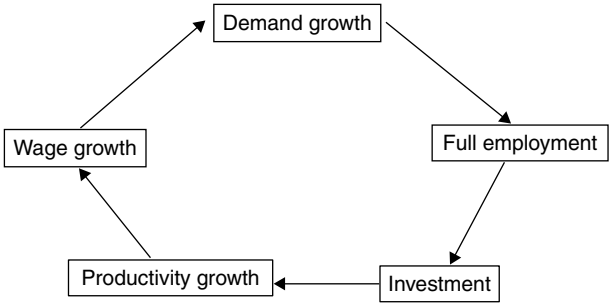

Figure 1.2 The Keynesian era virtuous circle growth model

model is illustrated in Figure 1.2, and it held in one form or another throughout much of the global economy – the USA, Europe, Canada, Japan, Australia, Mexico, Brazil, and Argentina.

After 1980 the virtuous circle Keynesian growth model was replaced by the neoliberal growth model. The key changes were (1) abandonment of the commitment to full employment, which was replaced by a focus on low inflation, and (2) severing of the link between wages and productivity growth. The new growth model made credit and asset price inflation the engines of demand growth, replacing wage growth as the engine of demand growth.

The neoliberal economic model weakened the position of workers and strengthened the position of corporations. It also uncuffed financial markets to serve the interests of financial and business elites. Reliance on debt and asset price inflation put financial markets at the center of the economic process, and hence the notion of financialization or financial neoliberalism.

Within the new model, finance plays three critical roles. First, it is critical to the aggregate demand generating process. Second, it is part of the mechanism for redistributing income between profits and wages. Third, financial sector interests guide economic policy, shaping regulatory policy, macroeconomic policy and international economic policy.

The neoliberal model undermined the income and demand generation process by shifting income from wages to profits and by widening wage inequality. That created a growing structural aggregate demand (AD) gap, and the role of finance was to fill that gap. Financial deregulation, financial innovation, speculation, and fraud enabled finance to fill the demand gap by lending to consumers and by inflating asset prices. However, three things should be emphasized. First, this role of

finance was not part of a grand plan, but was instead an unintended consequence; neoliberal economists and policymakers did not realize they were a creating a demand gap, but their *laissez-faire* financial ideology let loose financial sector developments that accidentally filled the demand gap. Second, the process was inevitably unstable and always destined to stall. There are limits to borrowing and limits to asset price inflation, and every Ponzi scheme comes apart eventually. The problem is that it is impossible to predict when: all we know is that it will end. Third, the process went on far longer than anyone expected. As a result, the collapse was far deeper when it eventually happened in 2008.

When the financial crisis hit in 2008, after considerable delay policymakers were successful in stabilizing the system and preventing a second Great Depression. The 2008 and 2009 bailout of banks and provision of emergency liquidity put a floor underneath the financial system and stopped the run (that is, the flight from financial assets) that threatened to bankrupt the system. Simultaneously, the fiscal stimulus packages of 2009 shored up AD and put a floor underneath the real economy.

These measures stabilized the system but they did not reform the structure of the economy. The financial crisis of 2008 symbolized the exhaustion and implosion of the neoliberal model. In the wake of the crisis, financial markets are no longer willing to finance the credit and asset price excesses that filled the demand gap and drove the system for so long. Moreover, the economic system is burdened by three major structural problems. First, there is a debt hangover from past borrowing that negatively impacts AD. Second, there are the scars of the financial crisis and recession in the form of destroyed creditworthiness, reduced collateral values, and diminished animal spirits. Third, the economy is still afflicted by the structural demand gap caused by deteriorated income distribution. Consequently, the prognosis is one of prolonged economic stagnation.

1.4 The paradox of explaining financialization

Economic policy has been critical for the implementation of financial neoliberalism, and economic theory has provided the justification for economic policy. The expansion of financial markets was approved and facilitated by policymakers, and their policy actions were justified by appeal to the types of arguments about the benefits of financial markets made in Section 1.2.

This introduces a paradoxical twist. Orthodox neoclassical economic theory provides the justification for financialization, yet the actual real

world effects of financialization can only be understood through a Keynesian economic lens. There is a need to understand neoclassical theory to understand the arguments of policymakers and their economic policy choices. However, there is also a need for a different economic theory to understand the effects of those policy choices.

Financialization involves the domination of the macro economy and economic policy by financial sector interests. That domination is partly accomplished through culture and the world of ideas. With regard to culture, popular US television shows like Jim Cramer's "Mad Money" that encourage stock market investing are important in shaping popular attitudes toward financial markets and the economy. Those attitudes in turn foster political outcomes that promote policies supportive of financial neoliberalism. With regard to ideas, the domination of financial interests generates ideas that are supportive of deregulation, the shareholder value maximization model, business domination of economic policy and politics, and enhanced social standing of finance. This resonates with Marx's characterization of the production of ideas in *The German Ideology* [1845]:

> The ideas of the ruling class are in every epoch the ruling ideas, i.e. the class which is the ruling material force of society, is at the same time its ruling intellectual force. The class which has the means of material production at its disposal, has control at the same time over the mental means of production, so that thereby, generally speaking, those who lack the means of mental production are subject to it.

To the philosopher of science this makes sense and helps explain the policy dominance of ideas supportive of financial sector interests. However, for those brought up on the belief that economics textbooks provide economic truth, it is disturbing and difficult to grasp. For economists, it poses the intellectual challenge of modeling an economy in which the rationalizations of policymakers are at odds with the way the economy works.

1.5 Structure of the book

Part I of the book explores the macroeconomics of financialization. Chapters 2 and 3 provide an overview of how financialization affected the macroeconomic structure of the economy via its impact on income distribution and debt.

Financialization is a process whereby financial markets, financial institutions and financial elites gain greater influence over economic policy and economic outcomes. The result is to transform the functioning of

economic system at both the macro and micro levels. The principal impacts are to (1) elevate the significance of the financial sector relative to the real sector, (2) transfer income from the real sector to the financial sector, and (3) increase income inequality and contribute to wage stagnation.

Financialization operates through three different conduits: changes in the structure and operation of financial markets; changes in the behavior of non-financial corporations, and changes in economic policy. Countering financialization calls for a multi-faceted agenda that (1) restores policy control over financial markets, (2) challenges the neoliberal economic policy paradigm, (3) makes corporations responsive to interests of stakeholders other than just financial markets, and (4) reforms the political process so as to diminish the influence of corporations and financial elites.

Chapter 3 explores the concept of financialization using a "stages of development" approach. The chapter presents a stylized history of financialization, and tracks its evolution through different stages since the end of World War II. The chapter uses a standard Kaleckian macroeconomic framework, focusing on how changes in remuneration patterns, financial engineering by firms, asset market valuations, and borrowing by firms and consumers affect macroeconomic outcomes.

The fact that financialization was long-running and expansionary in its early and middle stages made it extremely hard to oppose. That is because both policy and political processes have a bias against implementing change in good times. The political cost of change is immediate and direct, yet the political benefit is averting a hypothetical future cost. Even if that future cost were enormous, once it was averted it would still be hypothetical, whereas the costs of change are real and incurred.

Increases in the flow of credit and the level of debt are key characteristics of financialization. Chapters 4 and 5 focus on the macroeconomics of debt. Chapter 4 looks at the economics of debt-driven business cycles, focusing on the impact of borrowing and debt on AD. A critical feature is the transfer of debt service payments from debtors to creditors. Business cycles result from two mechanisms. One is the multiplier–accelerator mechanism. The second is a predator–prey mechanism whereby increased income feeds the level of debt, but the level of debt preys on the level of income.

Chapter 5 looks at the issue of deflation and inflation in the presence of debt, and shows how debt can undermine the capacity of the price mechanism to adjust the macro economy. This is the basis of Irving Fisher's (1933) classic debt-deflation theory of depressions, and

it vindicates claims made by Keynes (1936) in chapter 19 of *The General Theory* about the potential inability of the market system to restore full employment.

The chapter extends Tobin's (1975) well-known Keynesian analysis of deflation to cover inflation as well. It introduces a range of additional channels through which deflation and inflation may exacerbate excess supply and excess demand conditions. The chapter provides further theoretical reasons why downward price level adjustment may not solve the Keynesian problem. These arguments challenge the conventional wisdom that Keynes' General Theory is a special case resting on downwardly rigid prices and nominal wages. This conventional wisdom has led many economists to recommend policies promoting downward price and nominal wage flexibility. These policies have created an environment in which deflation is more likely, increasing the likelihood of deep stagnation.

Part II focuses on instability. This connects financialization with Hyman Minsky's (1992 (1993)) financial instability hypothesis that holds that capitalist economies have a genetic proclivity to instability. Financialization amplifies that proclivity. Chapters 6 and 7 examine the microeconomics of herd behavior and short-termism. These are important features of financial markets that explain why financial markets can produce socially sub-optimal outcomes; owing to the structure of incentives, it can be rational for an individual to do things that are irrational from the perspective of the system.

Chapter 6 provides a formalization of managerial herd behavior based on the principle of safety in numbers. The key features needed for herd behavior are that managers be individually risk averse and their remuneration be partly based on relative performance. That establishes an incentive for individual managers to run with the herd by imitating the decisions of other managers.

Chapter 7 presents a model of managerial short-termism based on managerial turnover. If managers' rewards are based on current profitability and there is some probability of future managerial turnover, then rational own-reward maximizing managers may choose projects that have intrinsically lower net present values but yield higher returns in the earlier part of the project life. This is because managers recognize that the existence of turnover means there is some probability that they will not be around to enjoy the returns generated by long-term projects.

This type of behavior is now widely recognized as being behind much of the unwise real estate lending (particularly sub-prime lending) that contributed to the house price bubble and financial crisis. That is because

the combination of the new "originate to distribute" model of mortgage lending and agents being paid significantly on the basis of commissions and bonuses set up incentives for loan pushing rather than sound lending. Under the "originate to distribute" model, banks make loans and then sell them as part of mortgage-backed securities (MBS). Banks want to earn fees from selling MBS, and as they do not hold onto the loan they do not care about its subsequent performance. Bankers, insurance agents, mortgage brokers, realtors, and property assessors all want deals to go through so that they can get their fees, commissions and bonuses. The net result is a significant weakening of lender side market discipline, because every one of these agents has an incentive to consummate the deal, as they earn a profit when the transaction is closed and no one bears the cost of future potential loan losses.

Behaviors such as short-termism and herd behavior are consistent with Hyman Minsky's (1992 (1993)) approach to financial markets. Minsky's focus is the broad economy, and his financial instability hypothesis emphasizes the gradual evolution of instability. This process is captured in the aphorism "success breeds excess which breeds failure."

Chapter 8 describes Minsky's theory of financial instability and expands it to include the idea of a Minsky super-cycle. The conventional Minsky business cycle is a financially driven boom–bust business cycle in which leverage increases over the course of the cycle, causing financial fragility that creates the conditions for the bust. The super-cycle is a long cycle that takes decades to work its course and occurs over several conventional Minsky cycles. The super-cycle captures the process whereby changes in financial regulation, financial sector technology, and social attitudes toward risk gradually allow more risk into the system, while also weakening the institutions and practices that contain risk. It is this process that ultimately permits financial crisis. The combination of the conventional cycle and super-cycle explains why financially driven business cycles occur every decade but financial crises occur over longer periods.

Part III addresses the question of growth. Financialization shifts the distribution of income away from labor (wages) to capital (profits). It also increases debt, giving rise to interest transfer payments from debtors to creditors. Both types of change can affect growth. The chapter examines the growth effects of consumer and corporate debt using a neo-Kaleckian growth framework. According to the neo-Kaleckian model, inside debt has an ambiguous effect on growth. This is counter to the intuition of static short-run macro models in which higher debt levels lower economic activity, and it shows intuitions derived from short-run macroeconomics do not always carry over to growth theory.

Growth is faster in endogenous money economies than in pure credit economies, *ceteris paribus*. That is because lending in endogenous money economies creates money wealth that increases spending and lowers saving. Interest payments from debtors to creditors are a critical channel whereby debt affects growth. In the consumer debt model, this interest transfer mechanism exerts a negative influence on growth. However, in the corporate debt model the transfer can raise growth if creditor households' marginal propensity to consume out of interest income exceeds firms' marginal propensity to invest out of cash flows.

Part IV concludes the book and turns to issues of policy. Chapter 10 explores the issue of how monetary policy should address asset price bubbles. This has emerged as an important issue in the wake of the US stock market bubble of the late 1990s and the US house price bubble of the noughties (2000–2007). Central banks have generally opposed targeting asset and credit market excess. The chapter argues against that position; bubbles can impose significant harm through the debt footprint effects they leave behind and through distortions resulting from using interest rates to mitigate their AD impacts. Conventional interest rate policy is not well suited to managing bubbles. Instead, the chapter argues for adoption of a new system of asset-based reserve requirements (ABRR). Not only can ABRR target asset market excess, but they also strengthen counter-cyclical monetary policy.

Chapter 11 discusses the question of how monetary policy and central banking should be conducted in the light of the financial crisis, the Great Recession, and the economic stagnation that has followed. The chapter emphasizes the implications of the crisis for economic theory and the resulting implications for policy. Focusing on the Federal Reserve, the chapter compares the mainstream insider reform program with an outsider reform program.

The insider program makes no changes to macroeconomic theory and is uncritical of the Federal Reserve's past actions. From its perspective, any failings of the Federal Reserve have been unwitting sins of omission. The outsider program challenges existing macroeconomic theory and is also highly critical of the Federal Reserve. From the outsider perspective, the failings of the Federal Reserve have included significant sins of commission rooted in political capture, cognitive capture, and intellectual hubris.

The proposed outsider reform program is rooted in a rethink of macroeconomic theory compelled by the crisis. There are some overlaps between the insider and outsider reform programs, but these overlaps are more

form than substance. That is dangerous because if similarity of form is mistaken for similarity of substance, this can confuse debate.

The *status quo* insider rethink focuses on the role of monetary policy in dealing with asset bubbles; making the central bank the banking system supervisor; and how to deal with the problem of the zero lower bound to nominal interest rates. The outsider reform program, in contrast, focuses on central bank governance and independence; reshaping the economic philosophy of central banks to be more intellectually open-minded; major monetary policy reform that includes adoption of an inflation target equal to the minimum unemployment rate of inflation (MURI) and implementation of asset-based reserve requirements; and regulatory reform that addresses problems of flawed incentives, excessive leverage, and maturity mismatch.

The outsider critique can be taken even further. The Federal Reserve is already legally mandated to pursue maximum employment with price stability. However, it needs institutional transformation that makes it think of itself as an agent for helping realize the "American Dream." That means it should have a duty to shape the allocation of credit and the financial system in ways that ensure growth, full employment and a fair share for all.

Chapter 12 concludes the book and circles back to the opening chapter's discussion of financialization as financial neoliberalism. Society is currently engaged in debate about the causes of the financial crisis of 2008 and the Great Recession. The chapter describes three competing explanations: the hard-core neoliberal "government failure hypothesis," the soft-core neoliberal "market failure hypothesis," and the structural Keynesian "destruction of shared prosperity hypothesis." Each hypothesis carries its own different policy prescriptions so that the explanation which prevails will influence importantly the future course of economic policy. That makes economics very important because it influences which explanation prevails.

As of the moment, the mainstream economics profession is split between the hard-core neoliberal government failure hypothesis and the soft-core neoliberal market failure hypothesis. However, things can change under the pressure of an ugly reality, as happened in the Great Depression of the 1930s. The only certainty is that change will be politically contested, because powerful elites and orthodox economists have an interest in preserving the dominance of the orthodox paradigm.

Part I

The Macroeconomics of Financialization

2
Financialization: What It Is and Why It Matters

This chapter explores the core construct of financialization. The chapter focuses on the US economy, which is where financialization seems to be most developed. However, judging by the increase in rentier income shares, financialization appears to have infected all industrialized economies (Power et al., 2003; Jayadev and Epstein, 2007).

Financialization transforms the functioning of the economic system at both the macro and micro levels. Its principal impacts are to (1) elevate the significance of the financial sector relative to the real sector; (2) transfer income from the real sector to the financial sector; and (3) contribute to increased income inequality and wage stagnation.

With regard to public policy, financialization raises concerns at both the macroeconomic and the microeconomic levels. At the macro level, the era of financialization has been associated with tepid real economic growth, and growth also shows a slowing trend.[1] This is illustrated in Tables 2.1 and 2.2, which show GDP growth and GDP growth per person employed by decade, for the period 1961–2010. The general pattern in these tables is one of slowing growth.

As shown below, the turn to financial neoliberalism occurred at the end of the 1970s and beginning of the 1980s. It was driven by the economic dislocations of the 1970s that produced increased inflation and a slowdown in growth, and its effect was to unleash three decades of credit

This chapter was first presented as a paper at a conference on "Finance-led Capitalism? Macroeconomic Effects of Changes in the Financial Sector," sponsored by the Hans Böckler Foundation and held in Berlin, Germany, October 26–27, 2007. It was originally published in Hein, Niechoj, Spahn, and Truger (eds), *Finance-led Capitalism: Macroeconomic Effects of Changes in the Financial Sector*, Metropolis-Verlag: Marburg, Germany (2008), pp. 29–60.

Table 2.1 GDP growth in selected countries and regions (% based on 2005 market prices)

	EA-12	EU-15	UK	US	Japan
1961–1970	5.3	4.8	2.8	4.2	10.1
1971–1980	3.4	3.1	2.0	3.2	4.4
1981–1990	2.4	2.4	2.8	3.2	4.6
1991–2000	2.1	2.2	2.6	3.4	1.2
2001–2010	1.1	1.2	1.6	1.6	0.7

Source: Statistical Annex of the European Economy, Directorate General Economic and Financial Affairs, European Commission, Autumn 2011.
Note: EA = Euro area; EU = European Union.

Table 2.2 Per person employed GDP growth in selected countries and regions (% based on 2005 market prices)

	EA-12	EU-15	UK	US	Japan
1961–1970	5.3	4.8	2.5	2.3	8.6
1971–1980	3.1	2.8	1.7	1.2	3.7
1981–1990	1.7	1.8	2.0	1.4	3.7
1991–2000	1.6	1.8	2.4	1.8	1.0
2001–2010	0.7	0.8	1.1	1.8	1.1

Source: Statistical Annex of the European Economy, Directorate General Economic and Financial Affairs, European Commission, Autumn 2011.
Note: EA = Euro area; EU = European Union.

expansion and asset price inflation that ended with the financial crisis of 2008. This climate of financial exuberance contributed to a public perception of faster growth. However, the reality is that growth in the first two decades essentially matched that of the disappointing 1970s, and in the third decade growth tailed off significantly. In the wake of the 2008 financial crisis, there are solid grounds for believing that growth over the next decade will be slower yet (Palley, 2012).

Prior to the crisis there were clear indications that financialization increased financial fragility, and the crisis of 2008 has cemented that view. The USA experienced a stock market bust in 2001 and there were a string of financial crises that afflicted the global economy in the late 1990s and early 2000s. These included the 1992 sterling crisis; the 1994 Mexican peso crisis; the 1997 East Asian financial crisis; the 1998 Russian crisis and the Long Term Capital Management crisis on Wall Street; the

Brazilian financial crises of 1999 and 2002; the Argentine financial crisis of 2001/2; and the Turkish financial crisis of 2001.

One way of understanding these developments is in terms of an unstable transition to a fragile new *status quo*. That the process was a transition is evident in rapidly rising household debt–income and corporate debt–equity ratios. Such increases had to eventually cease because of limits to increased debt burdens, while instability was evident in the repeated financial disruptions. The new *status quo* is fragile because it appears vulnerable to debt-deflation, and it also appears that growth will remain low.

One macroeconomic aspect of financialization is changes in financial structure that produce increased financial fragility. A second is changed income distribution marked by an increase capital's share and a decrease in labor's share (see Mishel et al., 2009). This process also represents a transition, with labor's share falling along the transition path and the new *status quo* being characterized by a lower labor share. In addition to raising social and political concerns, it also has implications for future aggregate demand (AD) conditions.

These two transition processes, of rising debt–GDP ratio and declining wage share, are structurally related. Financial neoliberalism shifted the distribution of income and undermined the AD generating process, creating a structural demand gap. As illustrated in Figure 2.1, the role of finance within this transition process was twofold. First, it provided some of the mechanisms for redistributing income from labor to capital by changing the behavior of non-financial firms and by influencing economic policy in ways supportive of financial and non-financial business interests. Second, it helped fill the growing structural demand gap by driving up asset prices and relaxing constraints on access to finance for both the household and the non-financial business sector. The problem after the financial crisis of 2008 is that the structural demand gap

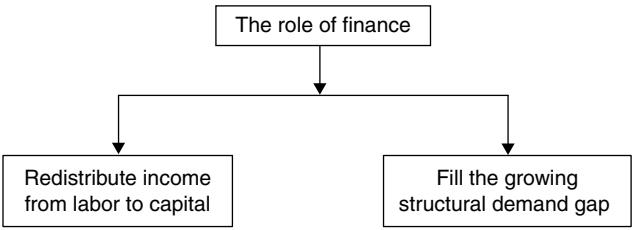

Figure 2.1 The role of finance in the process of financialization

remains but the financial system is constrained by limits to debt (Palley, 2012, chapter 8).

2.1 Financialization and conventional economic theory

Conventional economic theory has played an important role in promoting financialization. One area where theory has been especially important is the formulation of the relationship between firms and financial markets in terms of an agency problem (Jensen and Meckling, 1976), whereby the challenge is to get the firms' managers to maximize profits on behalf of shareholders. This representation has had important consequences. First, the agency approach envisages the solution to the corporate governance problem as one of aligning the interests of managers with those of financial market participants. That has been used to rationalize the explosion in top management compensation and stock option grants, and it has also been used to justify the rise of the leveraged buyout movement and private equity investment. Second, the agency approach promotes a legal view whereby the sole purpose of corporations – which are a societal construction – is to maximize shareholder returns within the confines of the law. That has served to restrict the scope of policy discussion to how to give shareholders greater control over managers. Meanwhile, broader questions regarding the purpose of corporations and the interest of other stakeholders have been kept completely off the policy table.

Conventional economic theory has also lent support for financialization by arguing that the expansion of financial markets enhances economic efficiency. This rationale draws from Arrow and Debreu's (1954) construction of financial assets as contingent claims. According to this view, expanding the scope of financial markets and the range of financial assets increases economic efficiency by expanding the states of nature spanned by financial instruments. This enables markets to better price future economic outcomes, improves the *ex-ante* allocation of resources across future contingent economic conditions, and helps agents assemble portfolios that provide better returns and risk coverage.[2]

Conventional theory has also tended to dismiss problems of financial speculation using Friedman's (1953) argument that speculation is stabilizing. According to Friedman, market prices are set on the basis of economic fundamentals. When prices diverge from those fundamentals this creates a profitable arbitrage opportunity. Speculators then step in

and buy or sell, depending on the direction of divergence, driving prices back to the level warranted by fundamentals.

Increasing the number of traders and volume of trading is also regarded as improving financial market outcomes. Increased trade volume increases market liquidity so that market prices are less susceptible to small random disturbances or manipulation by individual market participants.

Lastly, macroeconomic theory has also supported this optimistic view of financial markets through q-theory (Brainard and Tobin, 1977). "q" represents the ratio of the market price of capital to its replacement cost, and the q-ratio supposedly provides firms with a signal that efficiently directs investment and capital accumulation. Thus, when q is greater than unity, the market price exceeds the replacement cost. That sends a signal that capital is in short supply and profitable investment opportunities are available, and firms respond by investing.

As always, there is some mainstream literature challenging these conclusions, and that literature is growing with the emergence of the behavioral finance approach. For instance, rational expectations theory (Flood and Garber, 1980) acknowledges that market participants can rationally participate in bubbles if they have expectations of rising prices. The noise trader literature initiated by De Long et al. (1990) argues that risk-neutral speculators who trade purely on noise can generate market inefficiency if other traders are risk averse. Hirshleifer (1971) argues that financial market activity can be socially wasteful if the activity is the result of divergent subjectively held beliefs, making it more akin to betting at a racecourse than productive investment. In this case the race uses valuable economic resources but produces nothing of social value. Lastly, Crotty (1990) and Palley (2001) have criticized the logic of q-theory, arguing that it erroneously conflates the behaviors and expectations of managers with those of shareholders, and the reality is stock market signals to invest can be highly inefficient.

However, these critiques of financial market activity have been more akin to bubbles on a stream. Though they show that financial markets can generate inefficient outcomes according to conventional theory, they have had little impact on either broad thinking about financial markets or the direction of policy, both of which remain driven by the belief that expansion and deregulation of financial markets is welfare enhancing.

Most importantly, these critiques of financial markets are largely generated from within the conventional paradigm, so that they remain structured by that paradigm. Consequently, financial markets are assessed

Table 2.3 U.S. gross credit market debt outstanding (1973–2010)

	GDP ($ bils.)	Total credit market debt ($ bils.)	Total credit/GDP (%)	Financial sector debt ($ bils.)	Financial sector debt/ Total debt (%)	Non-financial/ Total debt (%)
1973	1,382.3	2,172.7	157.2	209.8	9.7	90.3
1979	2,562.2	4,276.4	166.9	504.9	11.8	88.2
1989	5,482.1	12,839.2	234.2	2,399.3	18.7	81.3
2000	9,951.5	27,137.6	272.7	8,157.8	30.1	69.9
2007	14,028.7	50,875.7	362.6	16,218.4	31.9	68.1
2010	14,526.5	53,353.1	367.3	14,141.8	26.5	73.5

Source: Economic Report of the President, February 2012, table B-1; Flow of Funds, table L.1, Board of Governors of the Federal Reserve, March 8, 2012; and author's calculations.

in terms of the neoclassical allocative efficiency paradigm, rather than being seen as part of an economic system that distributes power and affects the character of production and the distribution of income. The construct of financialization remedies this failing, but it requires replacing orthodox macroeconomics with Keynes–Kalecki macroeconomics.

2.2 The anatomy of financialization

The defining feature of financialization in the USA has been an increase in the volume of debt. Using peak business cycle years for purposes of control, Table 2.3 shows the evolution of total credit market debt outstanding between 1973 and 2010. The years 1973, 1979, 1989, 2000, and 2007 correspond to business cycle peak years, making them suitable for comparison. The inclusion of 2010 gives an indication of developments since the financial crisis of 2008.

Over the period 1973 to 2007, total issued debt rose from 157.2 to 362.6 per cent of GDP. Financial sector debt also grew much faster than non-financial sector debt, so that financial sector debt rose from 9.7 to 31.9 per cent of total debt over the same period while the non-financial sector's share fell. 1979 appears to mark a break point, with financial sector debt increasing much more rapidly relative to non-financial sector debt thereafter.

Table 2.3 is also indicative of the previously discussed transitional character of developments. Financial sector debt increased extremely rapidly relative to non-financial sector debt between 1979 and 2000. After 2000 that ratio stabilized, reflecting the establishment of temporary balance

Table 2.4 Sector decomposition of gross U.S. non-financial debt

	2007	2010
GDP ($ bils.)	14,028.7	14,526.5
Household debt ($ bils.)	13,782.4	13,328.6
Non-financial buisness debt ($ bils.)	10,758.5	11,158.4
Government debt ($ bils.)	7,990.1	12,451.11
Rest of world debt ($ bils.)	2,126.3	2,273.1
Household debt/GDP (%)	98.2	91.8
Non-financial buisnes debt/GDP (%)	76.7	76.8
Government debt/GDP (%)	57.0	85.8
Rest of world debt/GDP (%)	15.2	34.0

Source: Economic Report of the President, February 2012, table B-1; Flow of Funds, table L.1, Board of Governors of the Federal Reserve, March 8, 2012; and author's calculations.

between the financial and non-financial sectors. However, the total debt–GDP ratio kept rising after 2000 as finance continued to fill the demand gap created by financialization. Since 2007 total debt has continued growing but the financial sector has deleveraged and its debt has fallen relative to both GDP and non-financial sector debt.

Table 2.4 decomposes by sector the increase in non-financial sector gross debt since 2007. It shows that the relative increase has been principally due to budget deficits that have increased government's share of total debt. Household sector debt has fallen in absolute amount, reflecting the process of household deleveraging. In the wake of the crisis, government has been filling the structural demand gap created by financialization, which explains why government debt is increasing. That raises the question of sustainability of this process of government debt supporting the economy and whether it too ends in a public sector triggered financial crisis.

Table 2.5 provides an analysis of non-financial sector debt by type of credit. Consumer revolving credit is stripped out because its evolution largely reflects changes in payments technology (that is, increased use of credit cards) rather than fundamental changes in indebtedness. From 1979 to 1989 both non-mortgage and mortgage debt grew faster than GDP. From 1990 to 2000 both grew at approximately the pace of GDP. Then, from 2000 to 2007 both grew significantly faster than GDP, with the jump in mortgage debt being extraordinary and reflecting the US real estate price bubble.

Table 2.5 Decomposition of U.S. gross domestic non-financial debt by type of debt

	GDP ($ bils.)	Domestic non-financial debt ex-revolving credit & mortgage debt ($ bils.)	Domestic non-financial debt ex-revolving credit & mortgage debt/GDP (%)	Mortgage debt ($ bils.)	Mortgage debt/GDP (%)
1973	1,382.3	1,210.3	87.6	673.9	48.8
1979	2,562.2	2,214.9	86.4	1,331.5	52.0
1989	5,482.1	6,355.5	115.9	3,585.4	65.4
2000	9,951.5	10,730.2	107.8	6,752.6	67.9
2007	14,028.7	17,070.9	121.7	14,512.9	103.5

Source: Economic Report of the President, February 2012, Tables B-1, B-69, B-75, B-77, and author's calculations.

Table 2.6 Decomposition of U.S. gross domestic non-financial debt by sector

	GDP ($ bils.)	Non-fin. business debt ($ bils.)	Household debt ($ bils.)	Government debt ($ bils.)	Bus. debt/ GDP (%)	House. debt/ GDP (%)	Govt. debt/ GDP (%)
1973	1,382.3	727.6	626.8	541.1	52.6	45.3	39.1
1979	2,562.2	1,343.7	1,279.3	979.9	52.4	49.9	38.2
1989	5,482.1	3,644.3	3,316.2	3,191.6	66.5	60.5	58.2
2000	9,951.5	6,589.7	6,992.7	4,583.0	66.2	70.3	46.1
2007	14,028.7	10,758.5	13,782.4	7,990.1	76.7	98.2	57.0

Source: Economic Report of the President, February 2012, table B-1; Flow of Funds, table L.1, Board of Governors of the Federal Reserve, March 8, 2012; and author's calculations.

Table 2.6 provides an alternative decomposition of non-financial sector debt, by type of borrower. It highlights the critical role of debt in driving the economy. From 1973 to 1979 debt–GDP ratios across all sectors were roughly constant as debt grew in tandem with GDP. That changed after 1979. With regard to the non-financial business sector, there was a massive increase in the debt ratio in the 1980s, reflecting the leveraged buyout boom. That increase ceased in the 1990s, but resumed in the 2000s. With regard to the household sector, there was significant increase in the debt ratio in all three decades (1980s, 1990s, 2000s), but the increase was extraordinarily large in the 2000s, reflecting the house

Table 2.7 GDP share of the FIRE sector

	GDP ($ bils.)	Finance, Insurance & Real Estate (FIRE) ($bils.)	FIRE/GDP (%)
1973	1,385.3	189.5	13.6
1979	2,566.4	369.7	14.4
1989	5,482.1	981.0	17.9
2000	9,951.5	1,997.7	20.1
2007	14,028.7	2,857.0	20.4

Source: Economic Report of the President, February 2012 and February 2004, table B-12; and author's calculations.

price bubble. With regard to government, the debt ratio increased in the 1980s, reflecting the Reagan administration's turn to budget deficits.[3] In the 1990s the debt ratio fell back with the Clinton administration's shift to declining deficits and eventual budget surplus, but it rose again in the 2000s with the Bush administration's turn to deficit financed tax cuts. The overall picture is one of growing debt across all sectors playing a role financing AD, with household debt playing the largest and most sustained role.

Turning to the real economy, Tables 2.1 and 2.2 have already shown that the era of financialization has been associated with generally tepid economic growth. Except for the UK, average annual growth fell during the era of financialization that set in after 1979. Additionally, growth appears to show a slowing trend.

Table 2.7 shows the growing importance of the financial sector in the US economy. Between 1979 and 2007, the contribution of the finance, insurance and real estate (FIRE) sector to GDP rose from 14.2 per cent to 20.4 per cent. Table 2.8 shows that over the same period, FIRE employment as a share of total private sector employment rose from 6.6 per cent to 7.2 per cent.

These headline changes in levels of debt and the composition of macroeconomic activity have been accompanied by changes in the evolution of wages and the distribution of income. Figure 2.2 shows how wages and compensation of US production and non-supervisory workers (who constitute approximately 80 per cent of employment) have become detached from productivity growth during the era of financialization. From 1959 to 1979 wages grew roughly in line with productivity, but thereafter the two have diverged with wages and compensation

Table 2.8 Employment share of the FIRE sector

	Private employment (Thousands)	Finance, Insurance & Real Estate (FIRE) (Thousands)	FIRE/Employment (%)
1973	63,050	3,920	6.2
1979	73,864	4,843	6.6
1989	90,087	6,562	7.3
2000	110,995	7,687	6.9
2007	115,380	8,301	7.2

Source: Economic Report of the President, February 2012 and February 2004, table B-12; and author's calculations.

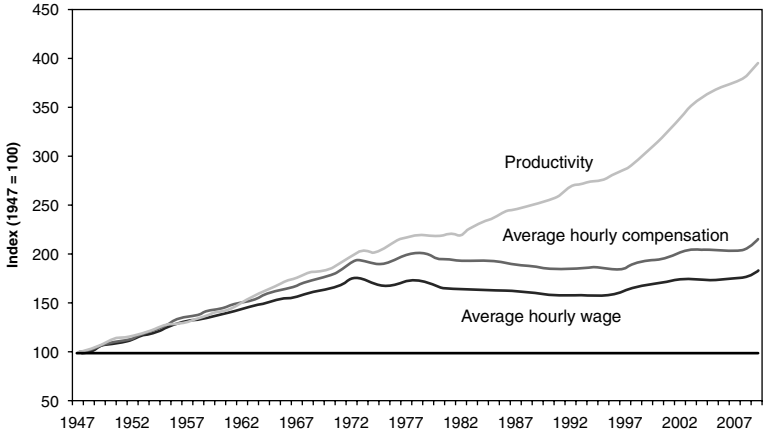

Figure 2.2 Productivity and real average hourly wage and compensation of US non-supervisory workers (1947–2009).
Source: Economic Policy Institute, Washington, DC analysis of Bureau of Economic Analysis and Bureau of Labor Statistics data.

essentially flat-lining while productivity has continued growing. This stagnation of wages has been accompanied by rising income inequality. Mishel, Bernstein and Shierholz (2009, p.60) report that in 1979 the income of the top 5 per cent of families was 11.4 times the income of the bottom 20 per cent of families. By 2006 this ratio had risen to 21.5 times.

Economists have identified multiple factors behind the stagnation of wages and the growth of income inequality (Palley, 1998; Gordon and Dew-Becker, 2007; Levy and Temin, 2007). Those factors include the erosion of unions, the minimum wage, and labor market solidarity;

globalization and trade; immigration; skill-biased technical change; and rising CEO pay supposedly driven by the logic of the economics of superstars. However, such analysis tends to treat these factors as independent of each other. The financialization thesis maintains that many of these factors should be linked and interpreted as part of a new economic configuration that has been explicitly promoted by financial sector interests.

The stagnation of wages and changes in personal income distribution has been accompanied by changes in the functional distribution of income, and these latter changes spotlight the role of financialization. Figure 2.3 shows the national income tree that describes how national income can be broken down into payments as wages and capital income. Wages can be decomposed into payments to managers and workers, while capital incomes can be decomposed into profit and interest payments, and profit can be decomposed into financial and non-financial sector profits.

Table 2.9 shows the evolution of capital's share of national income relative to labor's. Payments to capital were relatively constant over the period 1973 to 2000 but then increased dramatically in the period 2000 to 2007.

Table 2.10 provides data on corporate profits and interest payments. From 1973 to 1989 interest payments rose from 25.1 per cent of profits to 61.2 per cent, indicating a combination of change in the composition of payments to capital and the high interest rates that prevailed in the 1980s owing to Federal Reserve policy. However, by 2007 corporate interest

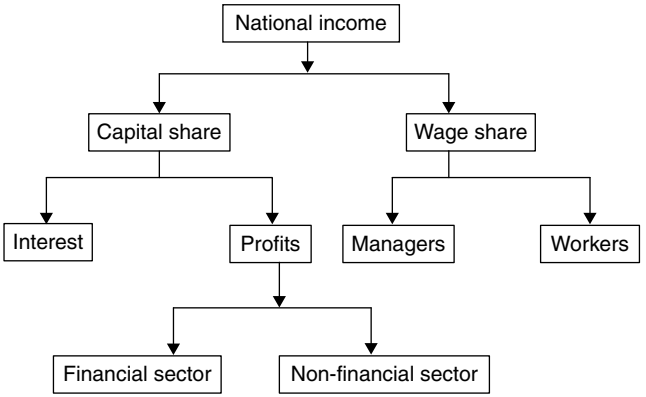

Figure 2.3 Financialization & the functional distribution of income

Table 2.9 Capital's share of national income relative to labor's

	Payments to labor ($ bils.)	Payments to capital ($ bils.)	Payments to capital/ payments to labor (%)
1973	662.4	274.8	41.5
1979	1,261.2	570.0	45.2
1989	2,650.2	1,143.2	43.1
2000	5,009.1	2,099.6	41.9
2007	6,796.9	3,552.6	51.8

Source: Economic Report of the President, February 2012, Table B-28; and author's calculations.
Notes: Payments to labor = private sector compensation of employees. Payments to capital = non-farm proprietors' income + before tax corporate profits + net interest & miscellaneous payments.

Table 2.10 Profits relative to interest payments

	Profits ($ bils.)	Interest payments ($ bils.)	Interest/Profits (%)
1973	219.6	55.2	25.1
1979	431.1	138.9	32.2
1989	709.1	434.1	61.2
2000	1,510.3	539.3	35.7
2007	2,791.0	731.6	26.2

Source: Economic Report of the President, February 2012, table B-28; and author's calculations.
Notes: Profits = non-farm proprietors' income + before tax corporate profits. Interest payments = net interest & miscellaneous payments.

payments had fallen back to 26.2 per cent, reflecting the low interest rates that prevailed in the 2000s and the surge in corporate profits after 2003.

Lastly, Table 2.11 shows the division of domestic corporate profits between the financial and non-financial sector. From 1973 to 2005, total profits rose from 7.3 per cent to 10.3 per cent of GDP. The financial sectors share of profits has risen especially strongly. In 1973 financial sector corporate profits were 20.1 per cent of non-financial corporate profits and they remained roughly constant relative to non-financial corporate profits in the 1970s. However, after that they rose steadily and rapidly from 19.7 per cent in 1979 to 44.6 per cent in 2007. In sum, with regard to capital income, the era of financialization has been marked by (1) a slight shift in income toward capital; (2) a change in the composition

Table 2.11 Decomposition of private sector corporate profits into financial and non-financial sectors

	Financial profits ($ bils.)	Non-financial profits ($ bils.)	Financial/Non-financial profits (%)
1973	16.1	80.0	20.1
1979	30.9	157.0	19.7
1989	59.5	226.8	26.2
2000	163.2	415.7	39.3
2007	309.5	694.1	44.6

Source: Economic Report of the President, February 2012, table B-28 and B-92; and author's calculations.

of payments to capital that has increased the interest share; and (3) an increase in the financial sector's share of total profits.

Turning to the composition of the wage share, no formal data exists regarding its division between managerial and workers wages. However, available evidence suggests there has been a shift in the wage share from workers to managers. Mishel et al. (2009, p.220) report that CEO pay has exploded from 35 times average worker pay in 1979 to 275 times worker pay in 2007. Bebchuk and Grinstein (2005) report that pay for the top five officers of S&P 500 companies rose from 5 per cent of corporate profits in the 1990s to over 10 per cent in the 2000s. Dew-Becker and Gordon (2005) report that over the period 1966 to 2001 only the top 10 per cent of the income distribution (which presumably includes the managerial class) had real compensation growth equal to or above productivity growth. Additionally, Mishel et al. (2009, pp.134–135) report that over the period 1979 to 2007 there has been an increase in worker wage inequality, with wages of higher paid workers in the top half of the wage distribution rising relative to those in the bottom half of the wage distribution.

2.3 Conduits of financialization

The financialization thesis is these developments regarding increased debt, changes in the functional distribution of income, wage stagnation, and increased income inequality are significantly due to changes wrought by financial sector interests. These changes concern the structure of the economy, economic policy, and the behavior of corporations.

The mechanics of financialization are illustrated in Figure 2.4, which shows how the influence of financial sector interests works through three

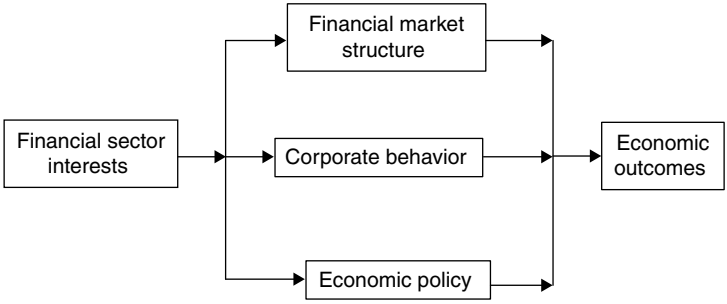

Figure 2.4 Conduits of financialization

distinct conduits. The first conduit concerns the structure and operation of financial markets. The second conduit concerns the behavior of non-financial corporations, while the third conduit concerns economic policy. Though not shown in the diagram for reasons of simplicity, these conduits also interact. Thus, economic policy affects the structure of financial markets and changes corporate behavior, while corporations lobby to affect economic policy.

2.3.1 Changes in the structure and operation of financial markets

The macroeconomic impacts of financial markets have been a traditional focus of macroeconomists. Financialization has changed the structure and operation of financial markets, and most existing theoretical work on financialization examines how these changes (particularly regarding credit availability) impact macroeconomic outcomes and the business cycle. A sense of this work can be gained from the following brief (and non-exhaustive) survey.

Some of the earliest work relevant to financialization concerned the effects of changing the menu of financial assets and liabilities (Tobin, 1961) and the macroeconomic effects of financial innovation and deregulation (Tobin and Brainard, 1963). Another early channel of inquiry was the impact of wealth and credit rationing on household consumption (Ackley, 1951; Modigliani and Brumberg, 1954; Modigliani and Ando, 1963). Tobin's q-theory (Brainard and Tobin, 1977) emphasized the influence of the stock market on business investment spending.

This early work on the macroeconomic effects of financial markets tended to ignore credit and debt, which has become the focus of recent work on financialization. Minsky (1982) has been especially influential

with his psychological theory of the business cycle that has agents borrowing and bidding up asset prices to unsupportable levels that is then followed by a crash. Additionally, there has been a resurgence of interest in Fisher's (1933) debt-deflation theory of recessions, which links the long-standing debate in Keynesian economics to whether price level adjustment can restore full employment in a monetary economy with nominal debt (Tobin, 1980; Caskey and Fazzari, 1987; Palley, 1999, 2008a).

Aspects of Minsky's (1982) construction of the business cycle have been picked up in the theory of the financial accelerator developed by Bernanke and Gertler (1996) and Kiyotaki and Moore (1997). However, Minsky places greater emphasis on subjective psychological forces and speculation. Financial accelerator theory emphasizes asset price inflation that raises collateral values, which allows more borrowing that finances investment spending and drives economic expansion. However, eventually firms' balance sheets become congested so that borrowing and investment fall, setting off a downturn in which asset prices fall. Credit constraints then tighten, causing a cumulative spiral downward.

The financial accelerator, which might also be termed the "balance sheet congestion" approach, has now become the major workhorse for mainstream theoretical enquiry into the macroeconomic effects of financialization. The focus is on how changes in financial markets affect collateral values and credit availability, thereby relaxing corporate balance sheet constraints and potentially making for more volatile and longer business cycles that may even be unstable.

Additionally, there is a specifically Post Keynesian line of inquiry that emphasizes the impact of debt on income distribution and aggregate demand (Palley, 1994, 1996a, 1997a). This Post Keynesian approach emphasizes how debt transfers income from high marginal propensity to spend debtors to lower marginal propensity to spend creditors, and this process of transfer can generate business cycles. However, this line of enquiry emphasizing income distribution effects has been ignored by the mainstream, which has instead chosen to focus on the corporate balance sheet congestion mechanism. Palley (1997a) connects this debt–income distribution–AD line of reasoning to the theory of endogenous money (Kaldor, 1970, 1982; Moore, 1988), to show how the ability of banks to create money increases the potential for financial instability.

Finally, there is an emerging Post Keynesian literature that seeks to examine the effects of financialization on long-run growth (Dutt, 2005, 2006; Palley, 2005a; Hein and Treeck, 2007; Lavoie, 2007; Skott and Ryoo, 2008). This literature focuses on the growth effects of increased

indebtedness, increases in the profit share, shifts in income away from workers, and lower retained profits of corporations. The emerging consensus is that these factors tend to reduce the long-run equilibrium growth rate. However, this conclusion is sensitive to assumptions about the response of aggregate demand to changes in the profit share. In particular, if investment responds strongly to an increased profit share and consumption is little affected by a lowered wage share, then growth can increase as a result of an increased profit share.

2.3.2 Corporate behavior

A second conduit for the influence of financialization is corporate behavior, which financial markets have worked to change so as to align with their interests. As discussed earlier, mainstream economic theory has played an important role via its construction of the issue of corporate governance as an agency problem. That construction has given rise to the notion of the market for corporate control, whereby managers are disciplined by the prospects of takeover and ouster if they fail to maximize profits. According to this view, financial innovations such as leveraged buyouts and private equity investing financed by junk bonds improve market efficiency because they compel managers to satisfy the interests of shareholders, who are the owners.

The agency approach to corporate governance has fostered the growth of stock option pay, the reasoning being that options serve to align the interests of management with those of shareholders. Top management has benefited from these new pay practices, and stock options have given managers an interest in maximizing the short-term stock price, which also benefits financial market money managers. However, it is not clear that shareholders have benefited, as the costs of top management pay have become staggeringly large (Bebchuk and Grinstein, 2005) and the long-term profitability of companies may have been prejudiced by the focus on the short-term share price.

This realignment of corporate manager interests to coincide with those of financial markets has been facilitated by the destruction of union power. This has removed a countervailing force that previously prevented managers from siding excessively with financial interests.

Corporations have also been encouraged to adopt a cult of debt finance. One reason is the tax code, which treats interest payments more favorably than profits. A second reason is that managers may have used debt as a tactic to drain free cash flow out of firms, thereby putting pressure on workers and leaving less for other claimants on the firms' income stream (Bronars and Deere, 1991). A third reason is that debt financing

increases leverage, thereby potentially raising the rate of return on equity capital. Such financial engineering fits with the Wall Street agenda that has demanded that corporations earn higher rates of return.

The net result of these developments is that corporate behavior has become increasingly dominated by and beholden to financial markets. That means non-financial corporate managers may have imported the behaviors of financial markets, which has impacted corporate investment and business decision making. From an agency theory perspective this is the desired outcome. However, it may not be good for corporations or the economy if financial market behaviors are governed by short-termism (Palley, 1997b) and herd behavior (Palley, 1995). Moreover, it may simply shift the agency problem from corporate managers to money managers in financial markets.

Evidence for these effects of financialization on non-financial corporate behavior is provided by changes in the patterns of corporate financial behavior. Figure 2.5 shows nominal new equity issuance and new credit market borrowing of non-financial corporations for the period 1959 to 2006. The striking feature is the abrupt change in the pattern of new equity issuance which turned negative after 1980. Post 1980, rather than being a net source of finance, the stock market has been a net drain of finance.

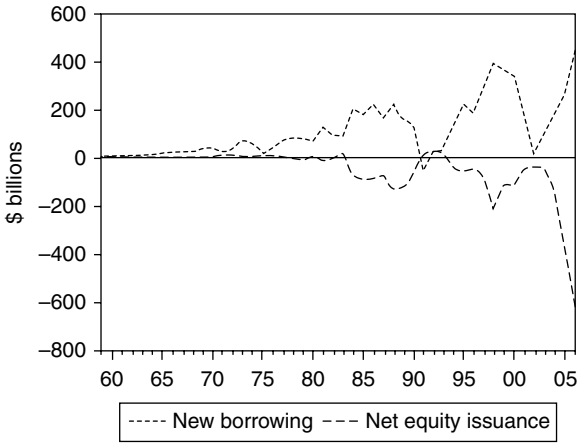

Figure 2.5 Non-financial corporation net equity issuance and new borrowing (1959–2006).
Source: Federal Reserve, flow of Funds, Tables F2 and F4

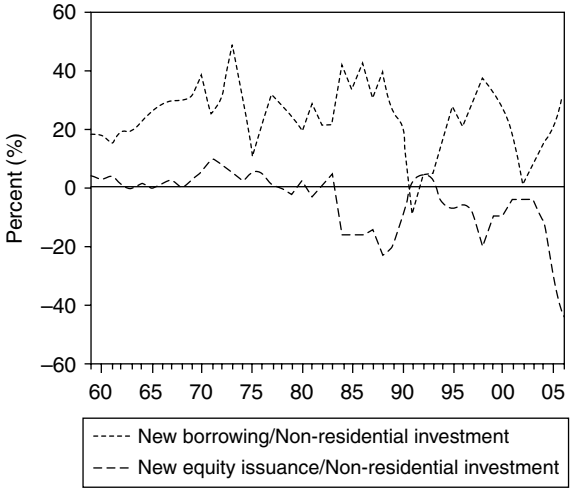

Figure 2.6 Non-financial corporation borrowing and net equity issuance as percentage of non-residential investment (1959–2006).
Source: Author's calculations based on Federal Reserve, Flow of Funds, tables F2 and F4, and Economic Report of the President, Table B-1, 2007

Figure 2.6 shows non-financial corporate new borrowing and equity issuance as a percentage of non-residential investment spending. This gives an indication of the scale of equity buy-backs, which reached 43.9 per cent of non-residential investment spending in 2006. Post-1980, new borrowing and equity purchases exhibit a clear negative correlation, which is indicative of how firms have borrowed to finance equity buy-backs. This new pattern suggests a changed purpose of corporate borrowing. Before 1980, it financed investment spending. Since 1980, a significant portion of borrowing appears to be for purposes of equity buy-backs, which has raised the debt–equity ratio.

These patterns fit the financialization thesis. Financial markets tend to prefer that corporations use debt to finance their activities owing to its tax advantages and the higher rates of return on equity that leverage allows. Financial markets have also supported corporations paying management with stock options, which requires purchasing the underlying stock. Additionally, rather than paying dividends that are highly taxed, markets prefer corporations to use profits to re-purchase stock, which drives up the stock price and generates lower-taxed capital gains. Finally, increased debt issuance transforms profit streams into interest

Table 2.12 Corporate sector profit rates.

	Pre-tax profit rate (%)	Post-tax profit rate (%)
1973	11.7	7.0
1979	9.6	5.7
1989	10.6	7.4
2000	12.1	8.4
2006	13.1	8.8

Source: Mishel et al. (2007, p. 88).

payment streams, which reduces corporate income available for other non-financial claimants.

2.3.3 Economic policy

The third conduit of financialization is economic policy. Financial sector interests supported by other business interests have promoted a policy framework favoring their agenda. That framework has uncuffed financial markets and facilitated their expansion, and it has also helped corporations shift income from labor to capital, to the benefit of financial sector interests. The new policy framework was designed to reverse the decline in rates of return to capital that occurred in the 1970s. Thus, short-term three-month real interest rates, which were negative for much of the 1970s, have been raised to approximately 2.5 per cent. Likewise, as shown in Table 2.12, pre- and after-tax profit rates have been pushed up significantly from 1979 lows.

The new policy framework can be termed the neoliberal box, the effect of which is to box in workers.[4] The box is shown in Figure 2.7. It has four

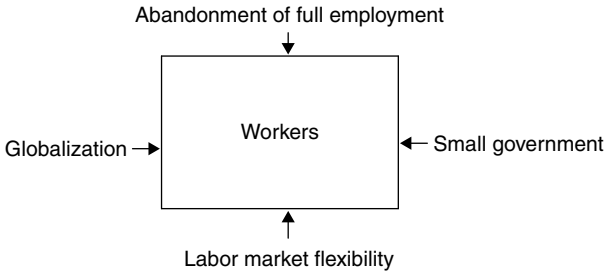

Figure 2.7 Economic policy and the neoliberal box

sides, labeled globalization, small government, labor market flexibility, and abandonment of full employment. Workers are inside the box.

"Globalization" refers to the collection of policies associated with free trade, capital mobility, multi-national business, and global sourcing. It also includes the Washington Consensus development policy that spreads the neoliberal box agenda globally, thereby multiplying its impact and also establishing a dynamic of deregulatory competition across countries. In this regard, there is a strong international dimension to financialization that centers on the elimination of capital controls, encouraging all countries to deregulate their internal financial markets.

"Small government" refers to the attack on the legitimacy of government activity, privatization, tax cuts that shrink the public revenue base, and deregulation – including financial sector deregulation. The small government agenda also covers policies regarding pension reform and saving. These policies have strongly encouraged a movement away from providing retirement income through group-based defined benefit pension plans to individual defined contribution arrangements such as 401(k) retirement saving plans. These new plans advance financial interests in several ways. First, they generate large fee income through charges for custodial services and brokerage commissions. Second, they increase individual investor demand for equities, which boosts equity prices. Third, they create an investor identity among households that generates favorable political support for policies favored by large financial interests.

The small government agenda has also spawned a version of public sector financialization through plutocratic tax cuts. These tax cuts have lowered higher bracket income tax rates and taxes on income from capital, creating large budget deficits. Table 2.13 shows that the publicly held debt–GDP ratio rose from 25 per cent of GDP in 1979 to 35.9 per cent in 2007. Government interest payments as a share of total revenues rose from 9.2 per cent in 1979 to 17.1 per cent in 1989, but then fell back as nominal interest rates came down in the 1990s and 2000s. The important insight from Table 2.13 is that public debt has also played a role in the financialization process, particularly in the 1980s during the Reagan administration when budget deficits were large and nominal interest rates were high.

"Labor market flexibility" refers to the agenda for weakening unions and eroding labor market supports such as the minimum wage, unemployment benefits, employment protections, and employee rights. This agenda has dominated US labor market policy, and it has also been implemented in Europe.[5]

Table 2.13 Publicly held government debt and government interest payments

	GDP ($ bils.)	Publicly held federal debt ($ bils.)	Publicly held debt/GDP (%)	Net interest ($ bils.)	Total receipts (on- & off-Budget) ($ bils.	Interest/ Receipts (%)
1973	1,382.3	340.9	24.7	17.3	230.8	7.5
1979	2,562.2	640.3	25.0	42.6	463.3	9.2
1989	5,482.1	2,190.7	40.0	169.0	991.1	17.1
2000	9,951.5	3,409.8	34.3	222.9	2,025.2	11.0
2007	14,028.7	5,035.1	35.9	237.1	2,568.0	9.2

Source: Econmic Report of the President, February 2012, tables B-1, B-78, and B-80, and author's calculations.

Finally, "abandonment of full employment" refers to changed priorities regarding monetary policy, which elevated the significance of low inflation and reduced the significance of full employment. This shift of focus toward low inflation has been implemented through policies of inflation targeting and central bank independence, both of which are supported by financial interests (Epstein, 1992, 2001; Palley, 1996b). Additionally, there is evidence that central banks have raised interest rates in economies with high union density despite the lack of any evidence that higher union density is associated with higher inflation (Palley, 2004a).

The policy configuration described by the neoliberal box challenges workers from all sides and puts continuous downward pressure on wages. This helps explain why wages have become detached from productivity growth and why income inequality has increased. Private sector workers are challenged by the box's globalization agenda; public sector workers are challenged by the small government agenda; and all workers are challenged by the labor market flexibility agenda and the abandonment of full employment as the primary goal of macroeconomic policy.

2.4 Financialization and the new business cycle

The combination of increased access to credit in financial markets and the new policy framework described by the neoliberal box, together created a new business cycle after 1980 (Palley, 2005b). The business cycles of Presidents Ronald Reagan, George H. Bush, Bill Clinton, and George W. Bush all shared strong similarities and were distinctly different

from pre-1980 business cycles. These similarities are an overvalued dollar; trade deficits; disinflation or low inflation; manufacturing job loss; asset price (equities and housing) inflation; widening income inequality; detachment of worker wages from productivity growth; and rising household and corporate indebtedness.

The foundation of the new business cycle was financial boom and cheap imports. Financial boom and asset price inflation provided consumers and firms with collateral to support debt-financed spending. Borrowing was also supported by steady financial innovation that ensured a flow of new financial products allowing increased leverage and widening the range of assets that could be collateralized. Additionally, credit standards were lowered in the years prior to the financial crisis of 2008, which made credit even more easily available to households, firms and financial investors. Meanwhile, cheap imports ameliorated the impacts of wage stagnation while widening income inequality, causing manufacturing job loss, and increasing economic insecurity.

This structure contrasts with the pre-1980 business cycle that rested on wage growth tied to productivity growth and full employment. Wage growth, rather than borrowing, fuelled consumption and demand growth. That encouraged investment spending, which in turn drove productivity and output growth

The differences between the new and old business cycle are starkly revealed by policy attitudes toward the trade deficit. Prior to 1980 trade deficits were viewed as a serious problem, being a demand leakage that undermined the virtuous circle of robust domestic demand and output growth. Post 1980, trade deficits have been viewed as the outcome of choices made by consenting economic agents that maximize economic well-being. For the Federal Reserve, trade deficits help with inflation control, and for politicians they help buy off consumers who face wage stagnation.

Finally, the new business cycle tacitly embeds a new monetary policy stance that replaces concern with real wages with concern about asset prices. Whereas pre-1980 policy tacitly focused on putting a floor under labor markets to preserve employment and wages, now policy tacitly puts a floor under asset prices. This policy behavior has been clearly visible with the 2007 US sub-prime mortgage crisis. It is not a case of the Fed intentionally bailing out investors. Rather, the macro economy is now vulnerable to asset price declines so that the Fed is obliged to step in to prevent such declines from inflicting broad macroeconomic damage. However, that has the twin consequences of bailing out investors and potentially creating investor moral hazard. Such moral

hazard encourages investors to chase even greater high risk–high return ventures because they know there is a good chance they will be bailed out by the Fed if things go wrong.

Moreover, the Fed itself may suffer from cognitive dissonance about this. On one hand, good policy requires that investors bear the financial costs of bad decision making. On the other hand, the macroeconomic system created by financialization may require rising indebtedness and asset prices to maintain growth. Consequently, not only does the Fed have reason to prevent asset price declines, but it also has reason to engage in serial blowing of asset price bubbles. That certainly appears to be the lesson of the 2001 to 2006 house price bubble.

2.5 What can be done?

Even before the financial crisis of 2008 there were serious concerns about financialization and the new business cycle. Economic growth was tepid, median wages stagnated, and income inequality and economic insecurity both rose. The crisis has vindicated and further deepened these concerns, and the outlook is one of prolonged stagnation (Palley, 2012).

Remedying these failings of financialization requires a fundamental change of policy paradigm so as to reconfigure the balance of economic power and the dynamic behind the business cycle. Financial markets are at the heart of the financialization process, which suggests there is an urgent need to restore effective control over these markets. Today, the only effective policy tool that monetary authorities have is the short-term interest rate. However, that tool is a blunt instrument, equivalent to a blunderbuss; thus, attempts to curtail financial speculation by raising interest rates can inflict serious collateral damage on the real economy. This suggests complementing interest rate policy with a new financial sector regulatory framework based on asset-based reserve requirements (ABRR).[6] Such a framework, which is discussed in Chapters 10 and 11, can help stabilize financial markets and provide an additional tool of monetary policy to supplement interest rate policy.

The policy framework described by the neoliberal box also constitutes a key element of the financialization program. That points to the need to challenge all sides of the box, and calls for restoring full employment policy (Palley, 2007); replacing the current corporate globalization with a globalization that allows policy space and equitable development; replacing the small government agenda with a progressive "better government" agenda; and replacing the labor market flexibility agenda with a good jobs and productive workplaces agenda.

Changed corporate behavior is another key part of financialization, with corporations being increasingly governed by the diktats of financial markets. Dealing with corporations involves three distinct different policy agendas. One is the mainstream corporate accountability agenda that emphasizes reining in excessive CEO pay, lack of corporate accountability, and misaligned incentives within firms. In a sense, this agenda recognizes that developments in corporate governance over the last 20 years have actually aligned the interests of top managers and money managers, rather than the interests of top managers and shareholders. A second, larger, agenda concerns reframing the legal purpose and obligations of corporations such that corporations are legally obligated to take into account interests of stakeholders other than just shareholders (Blair and Stout, 1999). A third agenda is how to align the incentives of money managers so that these managers represent the interests of savers in mutual funds.

Finally, policy has played a critical role advancing financialization, and policy is significantly driven by politics and lobbying. That simple observation means political reform is also needed. In particular, there is need to address the political power of financial and non-financial corporations, as well as wealthy individuals. Addressing this problem will require tackling issues of lobbying and the influence of wealth on politics. It also concerns the way the democratic political process is organized. That includes disclosure requirements for politicians. It also may require changing the rules of elections, perhaps replacing current "winner take all" arrangements with forms of proportional representation that can give greater voice to those without resources. The reality is that economic power affects politics, and politics affects economic policy and economic outcomes, in turn impacting economic power. That means politics and economic policy need to be linked rather than being seen as independent spheres, as has historically been the case.

3

The Macroeconomics of Financialization: Stages of Development Approach

Chapter 2 provided an empirical characterization of financialization. This chapter examines the macroeconomics of financialization using a stages of development approach that captures the evolving nature of financialization. This stages of development approach is suggested by Chick's (1986) treatment of the evolution of banking systems.

A stages approach is very consistent with the notion of financialization as a long-running evolving process. It also links with two other strains of economic thought. The first is the French regulationist (Boyer, 1990, 2000) and American social structures of accumulation (Tabb, 2010) approach which sees economies in terms of regulatory, political, and institutional arrangements that shape the process of capital accumulation. The second is Minsky's (Ferri and Minsky, 1992; Palley, 2009a) financial instability hypothesis that represents the economy as a financially driven long-running non-equilibrium process marked by changes in economic institutions, beliefs, and behaviors.

The chapter presents a series of simple models that describe a stylized history of financialization. This stylized history highlights both the economic impacts and the dynamic nature of financialization. The chapter focuses on the US economy, in which financialization is the most evolved and which therefore provides a longer, more extended, view that may be helpful for anticipating developments in other economies.

This chapter was initially presented at the Fifth International Conference, Developments in Economic Theory and Policy, held in Bilbao, Spain, July 10 and 11, 2008 and was published in Spanish as "The macroeconomics of financialization: a stages of development approach," *Ekonomiaz Revista Vasca de Economia*, 72 (2009): 34–53.

The process governing the evolution of financialization is long, and the duration of individual stages may be of unequal length. Moreover, some stages may be expansionary, while others may be contractionary. The beginning and middle stages of the process tend to be marked by expansionary forces, but the mature, later stage is likely marked by stagnation. The extended duration of the process means it can look stable yet ultimately prove unstable; formal discussion of the issue of stability is reserved for Chapters 4, 8, and 9 dealing with the business cycle, Minsky's financial instability hypothesis, and growth.

The fact that financialization is an extended process poses deep political and policy challenges. The process of financialization develops over a long time period and looks good for much of the time, yet the crisis of 2008 has confirmed that it ultimately hits the economic rocks. That raises profound political problems of how to initiate policy change that alters the direction of the process. Who is going to believe the case for change, and who will be willing to bear the political cost of implementing change if current economic conditions look good? Politicians are not rewarded for imposing pain now even if doing so prevents far greater future pain. Instead, they are rewarded for good times now.

Analytically, the chapter changes the focus of existing enquiry on financialization. The existing conversation (see for example Hein, 2008a, 2008b; Hein and van Treeck, 2007) focuses on the effect of financialization on the goods market price markup, income distribution and stock market valuations. This interest in the markup comes from the traditional Kaleckian model, as the markup is critical for determination of the functional distribution of income between wages and profits. The impact of financialization on the functional distribution of income is a valid question, and the model that is developed is capable of addressing it. However, the wage share has been relatively stable, which suggests the markup is not the key issue for understanding financialization. Instead, the chapter directs attention to the role of debt and the changing financing behavior of corporations and households.

The chapter examines changes in the way that firms have financed investment combined with changing patterns of dividend payouts. In this regard, no distinction is drawn between stock buy-backs and dividends, which are treated as macroeconomically equivalent – though in practice there is a difference, owing to the tax benefit from distributing profits via buy-backs rather than dividends. Additionally, the chapter introduces consumer debt, which was of critical significance in the last US business cycle expansion that ended in December 2007.

Lastly, the chapter incorporates concerns with the wage bill and the distribution of wages between workers and managers (Palley, 2005a). Over the last three decades there have been large changes in the distribution of the wage bill, with managers benefiting at the expense of workers. These changes can be interpreted as part of the mechanism of financialization whereby managers are induced to align their behaviors with financial market interests (Palley, 2008b, chapter 2).

3.1 The basic model

The basic model is the standard short-run Kaleckian macro model described by the following eight equations plus a growth equation:

$$y = aN \tag{1}$$

$$s_w + s_P = 1 \qquad 1 > s_w > 0, 1 > s_p > 0 \tag{2}$$

$$wN = s_w y \tag{3}$$

$$P = s_p y \tag{4}$$

$$y = C + I \tag{5}$$

$$C = \alpha_0 + \alpha_1 bwN + \alpha_2[1-b]wN + \alpha_3 R + \alpha_4 V \qquad 1 \geq \alpha_1 \geq \alpha_2 \geq \alpha_3 \geq \alpha_4 \geq 0 \quad 1 > b > 0 \tag{6}$$

$$I^* = \beta_0 + \beta_1 y + \beta_2 P + \beta_3 q \qquad \beta_0, \beta_1, \beta_2, \beta_3 > 0 \tag{7}$$

$$V = qP \qquad q > 0 \tag{8}$$

$$g = g(I/y) \qquad g' > 0, g'' < 0 \tag{9}$$

y = output, a = output per worker, N = employment, s_w = wage share, s_P = profit share, w = nominal wage, P = profits, C = consumption spending, I = actual investment spending, I^* = desired investment spending, b = worker share of the wage bill, 1 − b = managers' share of the wage bill, R = dividend and interest payments to owners, V = value of the stock market, q = stock market multiple valuing profits, and g = growth rate.

Equations (1)–(8) constitute an amended version of the standard Kaleckian short-run macro model that is used by those working in the Kaleckian tradition to study financialization. For simplicity, the government and foreign sectors are both left out of the model. The international dimension of financialization and its relationship to globalization is a separate topic.

One innovation is the inclusion of stock market wealth in the consumption function, a feature that has been, strangely, overlooked

by Kaleckians. It transpires that this has important implications for whether an economy is wage-led or profit-led. In a static context, an economy is wage-led if an increase in the profit share reduces economic activity, and profit-led if it increases economic activity. Large wealth effects on consumption make it more likely that an economy is profit-led, because a higher profit share will tend to raise the value of stock market wealth, generating a stock market wealth effect that increases AD.

Closing the basic model calls for additional equations determining actual investment spending (I), the dividend payouts of firms (R), and how firms finance their investment spending and dividend payouts. It is these additional equations that change with the evolution of financialization, and it is these issues that are the focus of the chapter.

Equation (1) is the standard linear aggregate production function. Equation (2) is the adding up of constraint on wage and profit shares. Equation (3) relates the wage bill to the wage share, while Equation (4) relates total profits to the profit share. Equation (5) is the goods market clearing condition, and has output equal to aggregate demand which consists of consumption and investment spending. Equation (6) is the aggregate consumption function. Equation (7) is the aggregate desired investment spending function. Equation (8) is the stock market valuation equation, and Equation (9) is a simple growth model in which the rate of growth is a positive function of the investment share. Latin letters denote structural parameters, while Greek letters denote behavioral coefficients.

The profit share is a critical parameter. Its effects ramify throughout the model, affecting consumption and investment spending through several channels. The profit share affects consumption via its impact on the wage share. It also affects consumption indirectly via the value of equities, which affects household wealth. Additionally, the profit share directly affects investment spending via its impact on the level of profits, and it also affects investment indirectly via stock prices. These varied channels illustrate why the profit share and income distribution are so central in the Kaleckian approach to macroeconomics.

Consumption (Equation (6)) depends positively on the worker share of the wage bill, dividend and interest payouts by firms, and the value of the stock market. Since the wage bill is divided between workers and managers, there are implicitly two different classes. Workers receive a fraction, "b", of the wage bill, and have a propensity to consume of α_1. Managers receive a fraction [1–b] of the wage bill, and have a propensity to consume of α_2 that is below that of workers. The propensity to

consume out of profits (α_3) and wealth (α_4) is assumed to be less than that out of wages.[1]

The division of the wage bill between workers and managers is an important analytical feature that has been largely overlooked in Kaleckian macroeconomics, which has tended to focus exclusively on the wage–profit division. Introducing a worker–manager wage bill division means an economy can simultaneously be both profit- and wage-led (Palley, 2005a). Thus, shifts in the distribution of income toward profits can stimulate economic activity by raising investment spending, and shifts in the composition of the wage bill toward workers can also stimulate activity by increasing consumption spending.

Desired investment spending (Equation (7)) depends positively on output, profits, and stock prices. The desired investment spending function has a conventional Keynesian accelerator channel (β_1). It also has a Kaleckian profit share channel (β_2) that proxies for both profit rate and cash flow effects (Fazzari, Hubbard and Petersen, 1988), as well a stock price channel (β_3) that reflects a Tobin q (Brainard and Tobin, 1968, 1977) or cost of equity capital channel.

Lastly, Equation (9) adds the simplest of growth models, thereby enabling some observations on the effect of financialization on growth. Growth depends positively on the investment share of output, a feature that has strong empirical support (De Long and Summers, 1991). An alternative specification might be in terms of the investment–capital ratio. Increased investment spending has a positive but declining marginal impact on growth, so that faster growth becomes progressively more costly to achieve. Substituting (7) into (9) yields

$$g = g([\beta_0 + \beta_1 y + \beta_2 P + \beta_3 q]/y) \tag{10}$$

A feature of Equation (10) is that the increases in output that lower the investment share will lower growth. This differs from the standard Kaleckian growth model, in which it is assumed that increased capacity utilization, which is analogous to increased output, raises growth. The difference is because the standard Kaleckian model has growth determined by the rate of capital accumulation (I/K) rather than the investment share (I/Y). If the I/Y ratio is the appropriate specification, increased capacity utilization caused by increased consumption could lower growth – unless capacity utilization (income) has a positive nonlinear effect on investment spending. This is an issue deserving of more theoretical and empirical study.

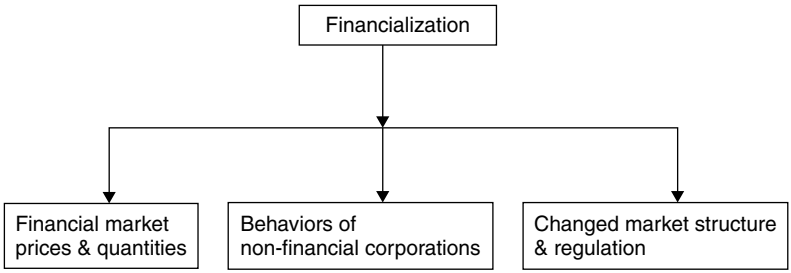

Figure 3.1 The channels of financialization

3.2 Channels of financialization

Figure 3.1 describes three channels whereby financialization affects the economic process. The first channel concerns changes in financial markets that impact the macro economy. These changes include changes in equity valuations, increased access to debt, and changes in the terms on which credit is made available.

The second channel concerns changes in the behavior of non-financial corporations. This may include changes in corporate financial policy regarding payouts to shareholders and changes in corporate leverage and financing behavior.

The third channel concerns changes in economic policy that financial interests lobby for. These policy changes include deregulation of financial and labor markets, and globalization, and they affect such important structural parameters as the profit share and the composition of the wage bill.

The balance of the chapter uses the basic model presented in Section 3.2 to construct a stylized historical narrative that shows how changes linked to financialization have changed patterns of economic outcomes.

3.3 Photo 1: the golden age of capitalism, 1945–1969

The analysis begins with the 25-year period after World War II that is often referred to as the golden age of capitalism. During this period the real economy was marked by full employment and rapid growth, while on the financial side profits were strong and the stock market boomed.

The stylized investment, financing, and dividend payout decisions of non-financial corporations during this first stage can be described by

$$I = \text{Min}[I^*, [1-v]P] \tag{11.1}$$

$$I^* < [1-v]P \tag{11.2}$$

$$R = \text{Max}[0, v[P-I]] \quad 1 > v > 0 \tag{11.3}$$

Equation (11.1) determines investment as the minimum of desired investment and retained profits. Inequality (11.2) has desired investment being less than retained profits, while Equation (11.3) has the dividend payout being equal to the maximum of zero or the fraction (v) of the excess of profits over investment spending.

Solving (11.1)–(11.3) yields $I = I^*$ and $R = v[P - I^*]$. During this period firms relied on internally generated financing, but profits were sufficiently strong for firms to fully cover desired investment as well as pay dividends. In effect there was no reliance on external funding.[2]

Substituting the solutions to (11.1)–(11.3) in the equations of the basic model then yields an expression for output, given by

$$\begin{aligned} y^* = \{&\alpha_0 + [1-\alpha_3 v][\beta_0 + \beta_3 q]\}/ \\ &\{1-\{\alpha_1 b + \alpha_2[1-b]\}[1-s_P] - \{\alpha_3 v + \alpha_4 q \\ &+ [1-\alpha_3 v]\beta_2\}s_P - [1-\alpha_3 v]\beta_1\} \end{aligned} \tag{12}$$

The critical parameters are s_P, b, v, and q. The comparative statics are

$$dy/ds_P \gtrless 0, dy/db > 0, dy/dv > 0, dy/dq > 0$$

$$dI/ds_P \gtrless 0, dI/db > 0, dI/dv > 0, dI/dq > 0$$

As in standard Kaleckian models, the effect of an increase in the profit share (higher s_P) is ambiguous. On one hand, there is a positive effect on investment and there is also a positive effect on consumption operating through stock market wealth. On the other hand, there is a negative effect on consumption due to a reduced wage share. If the economy is profit-led, the former effects dominate and a higher profit share raises output. If the economy is wage-led, the latter effect dominates and a higher profit share lowers output. This type of ambiguous outcome was first identified by Taylor (1983). The current model modestly supplements his analysis by introducing a profit share effect on stock market wealth and consumption. That additional channel increases the likelihood that economies are profit-led.

The impact on investment is also ambiguous. On one hand there is a direct positive profit share effect. However, balanced against that there is

the income accelerator effect, the sign of which is ambiguous and could offset the profit share effect. If the economy is profit-led, the accelerator effect is positive and reinforces the profit share effect. However, if the economy is wage-led it offsets the profit share effect and could overwhelm it.

That gives rise to the paradox that output could fall because the economy is wage-led, yet the growth rate could increase because the investment share increases. This unusual growth effect follows from specifying growth as a function of the investment share rather than the rate of capital accumulation (I/K), and it shows the significance of alternative specifications of the growth function.[3]

An increase in the propensity to consume by workers or managers increases output and investment because it raises AD. An increase in workers' share of the wage bill (higher b) has an unambiguously positive effect on output and investment. This is because it transfers wage income to workers from managers, and the former have a higher propensity to consume out of wage income. This illustrates how the model can be both profit- and wage-led, as a higher profit share and a higher worker share of the wage bill can both be expansionary.

An increase in the dividend payout ratio (higher v) has an unambiguously positive effect on both output and investment. That is because it increases disposable income, which increases consumption spending, which in turn raises output and investment. At the same time, increasing the dividend payout does not crowd out investment, because firms still have ample profits to finance investment.

Lastly, a stock market boom driven by investor exuberance (higher q) also unambiguously raises output and investment. First, it increases stock market wealth, which increases consumption. That raises output, which then has a positive accelerator effect on investment. Additionally, higher stock prices have a direct positive effect on investment via the Tobin q channel whereby higher stock multiples lower the required return on equity capital. In effect, stock market exuberance constitutes a form of animal spirits and its effect is always positive; higher stock market animal spirits constitute a form of Keynesian "free lunch".

3.4 Photo 2: conflictual capitalism of the 1970s

The 1970s witnessed the end of the golden age and a change of economic regime as the boom times of the 1960s gave way to stagflation and exacerbated conflict over income distribution. The new regime can be interpreted as one in which firms became subject to financial constraints

owing to a high employment squeeze on profits. In the profit-squeeze regime, investment spending and dividend payouts are characterized as follows:

$$I = \text{Min}[I^*, [1 - v]P] \tag{13.1}$$

$$I^* > [1 - v]P \tag{13.2}$$

$$R = vP \tag{13.3}$$

The important feature is that desired investment spending now exceeds retained profits so that investment spending becomes profit-constrained. There are two explanations for this new pattern. First, profits fell due to the OPEC oil shocks and a profit squeeze caused by labor militancy and high employment wage demands. Second, firms had previously expanded dividend payments and were now committed to maintaining those payments to shareholders.

Solving (13.1)–(13.3) yields $I = [1 - v]P$, reflecting the profit constraint on investment. Substituting this expression for investment in the equations of the basic model in turn yields an expression for output, given by

$$y^* = \alpha_0/\{1 - \{\alpha_1 b + \alpha_2[1 - b]\}[1 - s_P] - \{\alpha_3 v + \alpha_4 q + [1 - v]\}s_P\} \tag{14}$$

The comparative statics are

$$dy/ds_P \gtrless 0, dy/db > 0, dy/dq > 0, dy/dv < 0.$$
$$dI/ds_P \gtrless 0, dI/db > 0, dI/dq > 0, dI/dv < 0.$$

Once again the effect of a higher profit share (higher s_P) is ambiguous, for the familiar profit- versus wage-led reasons. However, in a regime where firms are profit-squeezed it is more likely that the economy will be profit-led. This is because the direct impact of a higher profit share on investment spending is likely larger, since it relaxes a financial constraint on firms' investment spending. Relaxing the profit constraint will have a large effect if v is small (that is, dividend payouts are small and retained profits are large), in which case the additional profit is spent almost entirely on investment. That positive effect may overhelm the negative impact on consumption that follows from a reduced wage share.

Since firms are profit constrained, output and investment fall in response to increased dividend payouts (higher v). This is because increased dividends reduce investment spending by a full dollar yet households spend only a fraction of their dividend income ($1 > \alpha_3$).

The stock market exuberance effect (higher q) remains unambiguously positive.

Lastly, shifts in the distribution of the wage bill toward workers still have an unambiguously positive effect on output and investment. However, this highlights a dilemma of the profit-squeeze regime, which may not be able to accomplish a stable adjustment. Suppose profits need to be restored, and this causes a higher markup that raises the profit share. The same forces that raise the profit share may also lower workers' share of the wage bill, in which case the outcome could be contractionary. What may be needed is a higher profit share and a higher worker share of the wage bill, but the market has no way of accomplishing this. That speaks to a potentially important role for measures such as incomes policy and corporate governance policies that constrain managerial pay while at the same time allowing a higher profit share.

3.5 Photo 3: 1980s leveraged buyout capitalism

The 1970s surfaced incipient conflicts within the economy by imposing a profit constraint on firms. The 1980s can be viewed as inaugurating the era of financialization that constituted part of a corporate strategy for addressing the challenges raised in the 1970s. Thus, firms started borrowing heavily to fund activities such as leveraged buyouts. This borrowing served three purposes. First, it pleased Wall Street by returning funds to shareholders. Second, it allowed firms to finance their desired investment spending plans. Third, it loaded firms up with debt, thereby pre-empting the income claims of workers. Furthermore, structural changes in the labor market weakened the bargaining position of workers. This shifted the distribution of the wage bill in favor of managers, a shift that is exemplified by the CEO pay explosion (see data provided by Mishel et al. 2009, p.221).

Capturing these developments requires respecifying firms' financing and investment decisions, which are described by the following equations:

$$D = D_{-1} + B \tag{15.1}$$

$$B = \text{Min}[D_{Max} - D_{-1}, B^*] = B^* \tag{15.2}$$

$$B^* = B_{DIV} + B_{INV} \tag{15.3}$$

$$B_{INV} = [I^* - [1 - v]P] \tag{15.4}$$

$$R = vP + B_{DIV} + iD_{-1} \tag{15.5}$$

$$I = \text{Max}[I^*, [1 - v]P - iD_{-1} + B_{INV}] = I^* \tag{15.6}$$

$$wN = s_W[y - ziD_{-1}] \qquad 0 < z < 1 \tag{15.7}$$

$$P = s_p y + s_W ziD_{-1} \tag{15.8}$$

$$V = q[P - iD_{-1}] + D_{-1} \tag{15.9}$$

where B = actual corporate borrowing, D_{-1} = last period's corporate debt, D_{MAX} = firms' debt ceiling, B* = firms' desired borrowing, B_{DIV} = borrowing to finance buyouts, B_{INV} = borrowing to finance desired investment, and i = nominal interest rate on debt.[4]

The logic of these relations is as follows. Equation (15.1) describes the evolution of firms' indebtedness. Equation (15.2) describes actual borrowing by firms, and it is assumed that firms can borrow as much as they desire (B*) because their balance sheets are still relatively unencumbered so that debt is below their debt ceiling. Equation (15.3) decomposes desired borrowing into borrowing to finance an exogenously given leveraged payout to shareholders plus borrowing to finance desired investment. Equation (15.4) defines borrowing to finance investment as equal to the shortfall between retained profits and desired investment.

Equation (15.5) determines the total payout to shareholders, which consists of dividends from profits, the leveraged payout, and interest on existing debt. Equation (15.6) determines actual investment spending.

Equations (15.7) and (15.8) determine the wage bill and profits. The important innovation is that the amount of income available for wages is reduced by debt service payments, reflecting how balance sheet engineering can pre-empt income claims of other stakeholders (Bronars and Deere, 1991). The coefficient z determines the extent to which debt reduces income available for wages by intimidating workers with the threat of bankruptcy. Pure neoclassical theory provides a benchmark that sets $z = 0$. The argument is that labor market competition ensures workers are paid their marginal product, which is technologically determined and unaffected by financial engineering. Kaleckian theory, however, argues that $z > 0$ because wages are determined by relative bargaining power.

Lastly, Equation (15.9) determines financial wealth which now consists of stock market wealth and debt claims against corporations. The value of equities is determined by the value of profits after interest payments. The value of debt is its face value. Substituting (15.7) into (15.9) yields

$$V = q[s_p y + s_W ziD_{-1} - iD_{-1}] + D_{-1} \tag{16}$$

The term $s_W ziD_{-1}$ represents the addition to shareholder value that comes from re-engineering the balance sheet and pre-empting wage claims in favor of profits.

Once again, neoclassical theory provides a benchmark. First, it maintains $z = 0$. Second, under the Modigliani–Miller (1958) theorem a dollar of income is always valued the same, regardless whether it is paid out as dividends or interest, so that $q = 1/i$. Consequently, the value of financial wealth is unchanged by financial engineering, and $V = qs_p y$. In a Post Keynesian framework, z can be non-zero and stock prices can be greater than or less than 1/i depending on the state of market exuberance.

Solving Equations (15.4)–(15.6) yields $I = I^*$. Combining Equations (15.1)–(15.9) with the basic model then yields a solution for output, given by

$$\begin{aligned} y^* = \{&\alpha_0 + \beta_0 + \alpha_3 B_{DIV} + \beta_3 q + \{\alpha_3[1 + v[1 - s_p]z] - \alpha_4 q[1 - [1 - s_p]z] \\ &- [\alpha_1 b + \alpha_2[1 - b]][1 - s_p]z + \beta_2[1 - s_p]z\}iD_{-1} + \alpha_4 D_{-1}\}/ \\ &\{1 - [\alpha_1 b + \alpha_2[1 - b]][1 - s_p] - \alpha_3 v s_p - \alpha_4 q s_p - \beta_1 - \beta_2 s_p\} \end{aligned} \tag{17}$$

Equation (17) is a complicated expression, but it is revealing of the channels whereby financialization affects economic activity.

As before, increases in the profit share are ambiguous because of the profit-led versus wage-led distinction. Redistributions of the wage bill toward workers (higher b) remain unambiguously expansionary.

Increases in the dividend payout ratio also remain unambiguously expansionary. That is because they distribute profit to households who spend part of it, yet investment is unaffected since firms obtain replacement finance by borrowing (B_{INV}) from banks. Similarly, a higher value of stock prices also remains unambiguously positive because of the impact on wealth and consumption, and because of the Tobin q effect on investment. Thus, the Keynesian animal spirits' free lunch continues to operate.

Large leveraged payouts to households (B_{DIV}) are also unambiguously expansionary. The logic is that firms finance these payouts by borrowing from banks and pass the funds over to households, which spend part of them.

Borrowing represents the flow dimension of credit, while debt represents the stock dimension. Whereas borrowing (B_{INV} and B_{DIV}) is unambiguously expansionary, the effect of the debt stock is more nuanced.

In the leveraged buyout regime, firms' debt stock is below their debt ceiling (D_{MAX}), which means firms always have access to more credit.

Consequently, the debt stock (D_{-1}) does not constrain borrowing, which means debt has no adverse effects on firms. It is only later in the financialization process, when debt constraints bind, that debt stock effects come fully into play.

One potentially contractionary effect of higher debt stocks is via their effect on the wage share, which is reduced by pre-empting income to pay off bondholders. That effectively increases the profit share, which is contractionary if the economy is wage-led. However, it is expansionary if the economy is profit-led.

A second effect of higher debt stocks operates via financial valuation effects. Recall, profit income is transformed into debt payments, which gives rise to two separate effects. A first, expansionary, effect is that the transformed profit is fully paid out as interest income. This is expansionary since none is held as retained profit, as can be seen from the expression for dividend and interest income, which is given by

$$R = v[s_p y - iD_{-1}] + iD_{-1} + B_{DIV} \tag{18}$$

A second, ambiguous, effect concerns the value of financial wealth. Transforming profit into interest payments reduces the financial value of equities and increases the financial value of debt holdings. Financial wealth increases if $q < 1/i$, which is expansionary. Alternatively, financial wealth decreases if $q > 1/i$, which is contractionary. In a depressed stock market, financial wealth is increased by using debt to buy back undervalued equities, whereas financial wealth is decreased by using debt to buy back overvalued equities.

In sum, as always, there are ambiguities in a complex macroeconomic system. That said, the leveraged buyout period of financialization was likely highly expansionary for two reasons. First, firms made large payouts to households, spurring consumption. Second, investment spending was unaffected because firms could fully finance their desired investment by borrowing from banks, as their debt was still below their debt ceiling.

What about the effect on growth? That depends on the impact on the I/y ratio. Compared to the 1970s conflictual capitalism regime, the leverage buyout regime likely contributed to a recovery of growth. However, compared to the unconstrained golden age, the effect is ambiguous and depends on the specification of the growth process. If growth is a function of the investment share (I/Y) there was likely little impact, as both I and Y both increase. However, if growth is a function of the accumulation rate (I/K) there may have been an increase in growth, since I increases.

3.6 Photo 4: 1990s and 2000s consumer debt capitalism

The corporate leveraged buyout boom that lasted until the early 1990s was succeeded by a consumer debt boom that lasted until the bust of 2007. Consumer borrowing is a critical part of the financialization narrative, yet it has been largely overlooked in the Post Keynesian literature. Just as corporate balance sheets were leveraged up to transfer income and spur growth, so too were household balance sheets.

This section addresses the issue of consumer financialization using a simple framework presented in Palley (1994, 1997a), augmented to include wealth effects operating via the stock market and via collateral effects. To simplify the presentation, the stylized model treats investment as exogenous and abstracts from the corporate sector issues identified in the previous section. This allows an exclusive focus on financialization's consumption dimension.

The basic model of consumer financialization is given by

$$y = C + I \tag{19}$$

$$C = C_W + C_K \tag{20}$$

$$C_W = bwN - iD_{-1} + B \tag{21}$$

$$C_K = \alpha_2[1 - b]wN + \alpha_3 R + \alpha_4 V \tag{22}$$

$$I = I_0 \tag{23}$$

$$s_w + s_P = 1 \qquad 1 > s_w > 0, 1 > s_p > 0 \tag{24}$$

$$wN = s_W y \tag{25}$$

$$P = s_p y \tag{26}$$

$$B = \text{Min}[D_{MAX} - D_{-1}, \varphi wN] \qquad \varphi > 0 \tag{27}$$

$$D = D_{-1} + B \tag{28}$$

$$R = v[P + iD_{-1}] \tag{29}$$

$$V = q[P + iD_{-1}] \tag{30}$$

C = aggregate consumption, C_W = consumption of debtor (worker) households, C_K = consumption of creditor (capitalist) households, B = worker borrowing, D_{-1} = last period's debt of worker households.

Introducing consumer debt requires distinguishing between debtor and creditor households. It is assumed that worker households do all the borrowing and that they have a marginal propensity to consume of

unity. That means all wealth is held by manager/capitalist households, and only they receive dividend and interest income. Workers borrow from banks, which are treated as part of the corporate sector. Instead of firms making interest payments to households (as in the previous section with corporate leverage buyouts), debtor households make interest payments to firms. Part of those interest payments is then redistributed as dividends to capitalist households.

Equation (19) is the national income identity. Equation (20) defines aggregate consumption, which consists of consumption by worker-debtor households and capitalist-creditor households. Equation (21) describes the consumption of worker households which is financed by wage income and borrowing but is reduced by debt interest payments. Equation (22) describes the consumption of capitalist households. Equation (23) determines investment, which for simplicity is exogenous. Equation (24) is the wage and profit share adding-up constraint. Equation (25) determines the wage share, and Equation (26) determines the investment share.

Equations (27)–(30) describe the financial dimensions of consumer financialization. Equation (27) determines consumer borrowing. Each period, workers borrow a fraction, φ, of their wage income as long as their total debt remains below their debt ceiling. Equation (28) determines the evolution of household debt. Equation (29) determines dividend income paid to capitalists which is derived from profits and interest income received by banks. Equation (30) determines the value of stock market wealth, which is the value placed on profits and bank interest income. The solution to the model is given by

$$y^* = \{I_0 + [\alpha_3 v + \alpha_4 q - 1]iD_{-1}\}/\{1 - b[1 - s_p] - \alpha_2[1 - b][1 - s_p] - \varphi[1 - s_p] + [\alpha_3 v + \alpha_4 q]s_p\} \quad (31)$$

There are four main dimensions to consumer financialization. First, worker borrowing is unambiguously positive, since it finances additional worker consumption. This effect is captured in the denominator by the term $-\varphi[1 - s_p]$.

Second, higher debt is contractionary if $[\alpha_3 v + \alpha_4 q] < 1$. The logic is that higher debt interest payments reduce worker consumption but they raise capitalist consumption by raising dividend payments from banks and by raising the stock market wealth of capitalists. Given that workers' propensity to consume is unity and capitalists' propensities to consume out of dividend income and stock market wealth (α_3 and α_4) is lower, this debt effect is likely negative.

Third, the parameter φ is of importance since it determines worker borrowing each period as a multiple of worker income. The processes of financial innovation and deregulation can be thought of as increasing the value of this parameter, which helped sustain the expansionary middle stage of financialization.

Fourth, the parameter D_{MAX} is also important, as it limits consumer borrowing. The processes of financial innovation and deregulation can be thought of as raising consumers' debt ceiling, thereby postponing the day when consumers are debt constrained.

As before, an increase in the profit share reduces consumption by reducing the wage income of worker and manager/capitalist households. Balanced against that, it increases capitalists' consumption by increasing dividends paid to capitalists and by increasing the value of stock market wealth held by capitalists. However there is now an additional negative channel, as a lower wage share reduces the amount that workers borrow each period. This suggests why consumer financial innovation has been so important, since raising the borrowing parameter, φ, can offset the negative effect that corporate leverage buyout financialization has on the wage share.

3.7 Photo 5: debt constraints and the coming long stagnation

The consumption-led expansion of 2001 to 2007 was followed by the deepest recession since the Great Depression of the 1930s. This recession can be thought of as marking the shift to the latest stage of financialization, when both corporations and consumers have become debt constrained.

The profound depth of the Great Recession can be captured by a model that combines the models developed to describe the US economy in the 1980s (Photo 3) and the 1990s and 2000s (Photo 4). The key feature of this combined model is the need to recognize both corporate and household debt. Moreover, at this stage households are debt constrained, while corporations have become anxious about debt levels. That has prompted both households and corporations to deleverage, so that they repay debt rather than borrow from banks.

The corporate sector's finance constraints are given by

$$D^{Corp} = D_{-1}^{Corp} + B^{Corp} \tag{32}$$

$$B^{Corp} = D_{Max}^{Corp} - D_{-1}^{Corp} = -Z^{Corp} \leq 0 \tag{33}$$

$$R = vP - Z^{Corp} + iD_{-1}^{Corp} \tag{34}$$

$$I = \text{Min}[I^*, [1 - v]P - Z^{Corp} - iD_{-1}^{Corp}] = [1 - v]P - Z^{Corp} - iD_{-1}^{Corp} \tag{35}$$

where D^{Corp} = debt of corporations, B^{Corp} = borrowing of corporations, $-Z^{Corp}$ = corporate debt repayments. Equation (32) tracks the evolution of corporations' debt. Equation (33) determines corporate borrowing, which is now characterized as negative. Equation (34) determines corporate dividend and interest payments. Equation (35) determines investment spending.

There are several features about these equations. First, corporations are treated as debt constrained, reflecting their anxiety about debt and desire to get back to some maximum level of debt. Equation (33) therefore has them deleveraging and repaying loans so that $B^{Corp} = -Z^{Corp} \leq 0$. Equation (35) determines investment spending, which is again profit constrained.

In a sense, the financial crisis moved corporations back to the earlier profit-constrained regime that characterized the 1970s. However, the situation was aggravated because corporate balance sheets were now deteriorated. Given corporate anxiety about debt, that further constrained investment spending since firms were deleveraging ($-Z^{Corp}$) and paying interest on existing debt (iD_{-1}^{Corp}). That lowered investment spending, with negative consequences for output and growth.

The household sector's finance constraint is given by

$$D^{Cons} = D_{-1}^{Cons} + B^{Cons} \tag{36}$$

$$B^{Cons} = D_{MAX}^{Cons} - D_{-1}^{Cons}, = -Z^{Cons} < 0 \tag{37}$$

Households are also debt constrained, and Equation (37) has them also deleveraging by paying back debt. This is unambiguously contractionary, because it directly reduces worker household consumption spending.

Whereas before borrowing spurred spending of households and corporations, deleveraging works in reverse as households and firms cut back spending in order to pay back debt. Moreover, the contractionary impulse is compounded, because both firms and households are burdened by debt interest payments that tend to further reduce demand.

The equations for the real sector of the economy are given by

$$y = C + I \tag{38}$$

$$C = C_W + C_K \tag{39}$$

$$C_W = bwN - iD_{-1}^{Cons} + B^{Cons} \tag{40}$$

$$C_K = \alpha_2[1 - b]wN + \alpha_3 R + \alpha_4 V \tag{41}$$

$$wN = s_W[y - ziD_{-1}^{Corp}] \qquad 0 < z < 1 \tag{42}$$

$$P = s_p y + s_W ziD_{-1}^{Corp} \tag{43}$$

$$V = q[P - iD_{-1}^{Corp} + iD_{-1}^{Cons}] + D_{-1}^{Corp} \tag{44}$$

Substituting Equation (37) into (40) yields an expression for worker consumption, given by

$$C_W = bwN - iD_{-1}^{Cons} - Z^{Cons} \tag{45}$$

This expression shows how consumer interest payments and deleveraging reduce worker consumption spending. Though the interest payment gets partially transferred to capitalist households and supports their consumption, the loan repayment extinguishes bank loans and has a pure negative impact on aggregate demand.

The level of investment spending is given by

$$I = [1 - v]P - Z^{Corp} - iD_{-1}^{Corp} \tag{46}$$

Corporate interest payments and loan deleveraging have an effect on firms parallel to that on worker households, reducing investment by tightening the financial constraint on firms. Corporate loan repayments extinguish loans and reduce investment without any offsetting positive effect on AD. Corporate interest payments reduce investment, but have a positive effect on capitalist household income that supports capitalist consumption.

Solving the model yields an expression for output, given by

$$\begin{aligned} y^* = \{&-[b + \alpha_2[1 - b]][1 - s_p]ziD_{-1}^{Corp} - Z^{Cons} - Z^{Corp} - iD_{-1}^{Cons} - iD_{-1}^{Corp} \\ &+ \alpha_3[iD_{-1}^{Corp} - Z^{Corp}] + \alpha_4[q[iD_{-1}^{Cons} - iD_{-1}^{Corp}] + D_{-1}^{Corp}] \\ &+ \{\alpha_3 v + \alpha_4 q + [1 - v]\}[1 - s_p]ziD_{-1}^{Corp}]\}/ \\ &\{1 - [b + \alpha_2[1 - b]][1 - s_p] - \alpha_3 vs_p + \alpha_4 qs_p + [1 - v]s_p\} \end{aligned} \tag{47}$$

This complicated expression is actually fairly simple to understand and conveys significant insight into the difficulties the economy faced during the financial crisis and still faces.

The first term in the numerator ($-[b + \alpha_2[1- b]]\{1-s_P\}ziD_{-1}^{Corp}$) is negative, and reflects the fact that leveraged buyout financialization lowers the wage share by pre-empting claims on income. That lowers consumption spending of both worker and manager/capitalist households.

The second term in the numerator ($-Z^{Cons}$) is also negative. It represents the negative impact on consumption of debt deleveraging by worker households.

The third term in the numerator ($-Z^{Corp}$) is again negative. It represents the negative impact on investment of debt deleveraging by firms. These payments tighten the finance constraint on firms and compel dollar-for-dollar reductions of investment spending. They also have a negative effect on dividend payouts, since profits must be used to pay back loans rather than finance dividends, and that reduces capitalist household income and consumption ($-\alpha_3 Z^{Corp}$).

The fourth term in the numerator ($-iD_{-1}^{Cons}$) is also negative. It represents the negative impact of debt interest payments on the consumption of worker households.

Finally, the fifth term in the numerator ($-iD_{-1}^{Corp}$) is also negative. It represents the negative impact of debt interest payments on firms' investment spending. As with loan repayments, these payments tighten the finance constraint on firms.

Balanced against these negative effects are two positive effects. First, corporate interest payments are paid to capitalist households, increasing their income and consumption ($\alpha_3 iD_{-1}^{Corp}$). Second, worker interest payments raise the value of profits, which raises capitalist financial wealth and consumption ($\alpha_4 q\ iD_{-1}^{Cons}$). For reasons discussed earlier in connection with asset market valuations and the Modigliani–Miller theorem, the effect of corporate debt payments on capitalist financial wealth and consumption is ambiguous ($-\alpha_4 q\ iD_{-1}^{Cons} + iD_{-1}^{Corp}$).

These numerous channels show how the effects of financialization ramify throughout the economy. Financialization affects the wage share and the functional distribution of income; redistributes income between worker households and capitalist households; transforms profit into interest that is then paid to capitalist households; and first boosts consumption and investment spending via borrowing, then constrains them through deleveraging and debt service payments.

One politically interesting feature of the stagnation regime is that the profit share can be quite high yet firms and the economy can appear

profit squeezed. This is because profit income is pre-committed to pay interest obligations and firms are debt constrained and compelled to deleverage. Such a configuration can create a troubling political economy in which firms argue they must squeeze wages further to create higher profits to finance investment. Yet the economic reality is that firms need to recapitalize to reduce debt rather than increase the profit share.

Lowering the interest rate can have a potentially large beneficial effect on consumption and investment spending by lowering the debt service burden on worker households ($-iD_{-1}^{Cons}$) and firms ($-iD_{-1}^{Corp}$). However, one problem (not modeled) is that though the monetary authority may lower its base interest rate, market interest rates charged to firms may actually rise due to increased spreads associated with credit risks from high leverage and reduced economic activity (Palley, 2008c).

In sum, past accumulation of corporate and consumer debts is likely to initiate a period of stagnation marked by high unemployment rates and reduced economic activity levels. Growth will also fall if investment declines proportionately more than income.

3.8 Conclusion

Financialization has been a major feature of the US economic landscape over the past 30 years. The process of financialization has been a long-running evolving process, marked by transition through different stages. The early and middle stages were characterized by relatively robust economic conditions that were fuelled by corporate and consumer borrowing. However, the US economy now appears headed for extended stagnation owing to accumulated debt burdens and the shift to deleveraging in place of leveraging.

Financialization should not be thought of in isolation from other economic developments. Instead, it should be viewed as the financial arm of the neoliberal policy paradigm that was put in place in the 1980s to counter the challenges faced by capital in the late 1960s and 1970s (Palley, 2009b). The neoliberal paradigm redistributed income from wages to profits, and it also redistributed wage income away from workers to manager/capitalists. That redistribution posed a threat to aggregate demand. Financialization helped fill the hole in demand created by this redistribution.

The fact that the process of financialization was long-running and expansionary in the early and middle stages made it extremely hard to oppose. When times are even half-good it is difficult to push policy change, because both the policy and political process have an inbuilt bias

against implementing change in good times. The political cost of change is immediate and direct, yet the benefit is averting a hypothetical future problem.

This political bias was further reinforced by the fact that the expansionary phases of the financialization process were able to run for so long. That is where financial innovation and deregulation became so important, as they allowed the debt accumulation and leveraging process to run far longer than could have been reasonably expected. Moreover, the run was further extended by a massive housing bubble at the tail end. Consequently, those who warned about the financialization process were written off as Cassandras though, like Cassandra, they were ultimately proven right.

Finally, the unpredictability of evolutionary processes like financialization has major implications for their economic representation and study. Such processes are fundamentally innovative and change the structure of the economy. That means standard time series econometrics will have great difficulty tracking them because they are subject to repeated structural breaks. Time series will also be of little use predicting the future, since that future is driven by a process that does not yet exist. Cross-section panel analysis will catch features of a particular stage, but that provides a very incomplete understanding of the fundamental process. In contrast, a stylized facts – stage of development approach has great value, as it provides a theoretical understanding of where the process has come from and is suggestive of where it is likely to go.

4
The Simple Analytics of Debt-driven Business Cycles

Chapter 3 presented a static stages of development model of financialization. A key feature was increasing debt and debt burdens in both the household and corporate sector. This chapter explores how debt can give rise to boom–bust business cycles.

Mainstream macroeconomics has a long history of interest in money and the business cycle, but it has displayed relatively less interest in the relation between credit and the business cycle. In contrast, the Post Keynesian Kaleckian tradition, which informs this study of financialization, places credit at the center of macroeconomics. First, bank lending is at the center of the money supply creation process (Moore, 1988). Second, nominal debt explains why downward price and nominal wage adjustment are incapable of solving the Keynesian problem of deficient demand (Tobin, 1980; Caskey and Fazarri, 1987; Palley, 1991/92, 1999, 2008a, 2008d). Third, the interaction between the positive aggregate demand effects of borrowing and the negative aggregate demand effects of debt constitute a critical mechanism driving the business cycle and creating financial instability (Minsky, 1982; Gallegati and Gardini, 1991; Semmler and Franke, 1991; Skott, 1994; Palley, 1994, 1997a; Skott and Ryoo, 2008).

This chapter excavates the role of debt in the business cycle and explores the different channels through which debt contributes to fluctuations in real economic activity. A Keynes–Kalecki analysis of debt focuses on its negative impact on aggregate demand (AD).

This chapter is a significantly reworked version of a paper originally presented at the Allied Social Science Association meetings held in San Diego, CA, January 3–5, 2004. That paper was subsequently released as "The simple analytics of debt-driven business cycle," Working Paper 200, Political Economy Research Institute, University of Massachusetts, Amherst, April 2009.

Financialization has aggravated the economy's demand constraint by adversely impacting income distribution. The resulting shortage of demand was filled by borrowing that financed spending, but that borrowing increased debt and strengthened the role of debt in generating business cycles.

4.1 Channels of debt-driven business cycles

There are two core channels whereby debt generates cycles. The first, which was pioneered by Kalecki (1937) and extended by Minsky (1982), can be termed the "balance sheet congestion" channel. Kalecki's (1937) balance sheet congestion channel works through his principle of "increasing risk." The argument is that as firms borrow and become more leveraged, they are exposed to greater likelihood of bankruptcy. That raises the required rate of return on projects, thereby discouraging investment (Mott, 1985/86). This balance sheet congestion channel can also be interpreted in terms of credit rationing (Stiglitz and Weiss, 1981). Thus, accumulation of debt over the course of the cycle leads to deterioration in the quality of firms' balance sheets and increased debt service obligations, which in turn restricts firms' ability to borrow and finance further investment. Early examples of business cycle models that rely on balance sheet congestion effects include Gallegati and Gardini (1991), Franke and Semmler (1991), and Skott (1994).

The second channel can be termed the "debt service transfer" channel. It was pioneered by Fisher (1933) and has been applied in a business cycle context by Palley (1994, 1997a). The key feature is that debtors and creditors have different marginal propensities to consume (MPC) so that transfers from debtors to creditors have AD effects that drive the cycle.[1] Palley (1994) places this channel in a consumption-focused model of the business cycle where there are transfers between debtor and creditor households. Transfers can also operate between firms and households, but there are important analytical differences between the two. The inter-household transfer channel rests on differences in propensities to spend between debtor and creditor households; impacts aggregate consumption spending (C); and is unambiguously contractionary because debtor households have a higher propensity to consume. The firm–household debt service transfer channel involves transfers from debtor firms to creditor households; impacts both investment (I) and consumption (C) spending; and can be contractionary or expansionary depending on the size of households' propensity to consume relative to firms' propensity

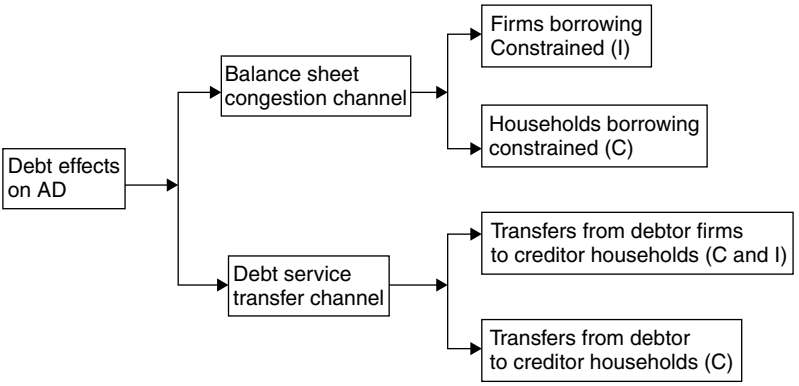

Figure 4.1 Channels via which debt impacts economic activity and causes business cycle

to invest out of free cash flows. These channels of impact are illustrated in Figure 4.1.

4.2 Propagating mechanisms of debt-driven cycles

The economic effects transmitted through the balance sheet congestion and debt service transfer channels in turn rely on two propagating mechanisms that can generate cycles of instability. One propagation mechanism is the familiar multiplier-accelerator mechanism developed by Samuelson (1939). Applied to a model with credit, the multiplier works via borrowing which adds to AD, and the accelerator kicks in via the induced change in income that facilitates higher borrowing. This mechanism can be captured as follows

$$y = \alpha_0 + \alpha_1 y_{-1} + \alpha_1 b \quad (1)$$

$$b = \beta_0 + \beta_1 \Delta y_{-1} \quad (2)$$

where y = level of output, b = borrowing, and $\Delta y_{-1} = y_{-1} - y_{-2}$. The coefficient α_1 constitutes the multiplier mechanism whereby exogenous changes to demand (α_0) or borrowing (β_0) change current period AD and output (y), triggering a subsequent multiplier sequence of output expansion or contraction, depending on whether the initial change was positive or negative. The coefficient β_1 represents the accelerator mechanism whereby changes in income induce further changes in borrowing.

This mechanism is critical for generating cycles. The change in past income ($y_{-1} - y_{-2}$) affects current period borrowing and income (y), acting as an accelerator with regard to prior developments. Current output will fall if the change in past output turns negative, which opens the way for cycles.

The multiplier (α_1)-accelerator (β_1) mechanism is an exclusively flow-based mechanism relating the flow of borrowing to changes in the flow of income. However, there are also impacts from the accumulated debt stock. Borrowing increases economic activity, but it also increases the debt stock, which must be serviced – and debt service payments may reduce AD and economic activity.

In effect, debt has a Janus-like character whereby increases in debt (borrowing) initially increase AD, but subsequent debt service payments on the increased debt stock reduce AD. These negative debt stock effects impact consumption via household borrowing, and they impact investment spending via firm borrowing. This flow-stock effect is analogous to a predator–prey mechanism that supplements the basic multiplier-accelerator mechanism. Income serves as prey that feeds the capacity to accumulate debt, and the accumulated debt stock is the predator that feeds on income.

Figure 4.2 illustrates these twin mechanisms. The right-hand loop between borrowing and income flows constitutes the familiar multiplier-accelerator mechanism. The predator–prey mechanism operates across the two loops. Higher income allows for additional borrowing that in turn raises debt, but higher levels of debt reduce AD and income (the direct channel), reducing borrowing. Additionally, higher debt reduces the ability to borrow, which then also reduces AD and income (the indirect channel). The cross-looping process shown in Figure 4.2

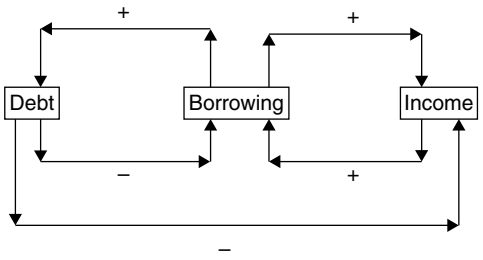

Figure 4.2 The predator–prey structure of the interaction between debt and income. Higher income feeds borrowing and debt, but higher debt reduces borrowing and income

represents a stock-flow process in which the stock variable (debt) preys on flow variables (income and borrowing), while the borrowing and income flow variables feed the debt stock. Hence the analogy between debt-driven business cycle models and predator–prey models.

4.3 Two models of the business cycle

The previous section analyzed the propagating mechanisms that can generate debt-driven business cycles. This section presents two Keynesian models that illustrate the role of debt in business cycles. The first model is a consumer debt model with debt service transfers between debtor and creditor households. The second model shows how the debt service transfer mechanism also works between households and firms.

In both models the economic logic of cycles is similar. Borrowing to finance consumption and investment increases AD, which expands income. It also increases debt. Accumulating debt burdens start to slow borrowing and eventually outweighs the positive effect of new borrowing, at which stage the cycle goes into reverse. The downturn is marked by debt repayment, which lowers AD and income but also reduces debt burdens. Eventually, the benefit of reduced debt burdens comes to dominate, and the cycle reverts to expansion mode.

4.3.1 A consumer debt model of the business cycle

The starting point for the analysis is the model of a consumer-debt-driven business cycle presented by Palley (1994). That model involves two types of households – debtors and creditors. Debtor households borrow from creditor households and have a higher marginal propensity to consume. Consequently, their borrowing increases AD and output, and the increase in output raises their debt ceiling, thereby allowing additional borrowing. This is the multiplier-accelerator mechanism.

The predator–prey mechanism works through debt service burdens. Thus, additional borrowing raises debtor household indebtedness, which increases debt service transfers to creditor households. Since debtors have a higher propensity to consume, these transfers reduce AD, and in this way accumulated debt preys on output.

This process is captured in the following six-equation model:

$$y_t = c_{1,t} + c_{2,t} + a_0 \qquad \text{[Aggregate Demand]} \qquad (3)$$

$$c_{1,t} = a_1[zy_{t-1} - S_t] + \Delta D_t \qquad 0 < a_1 < 1, 0 < z < 1 \quad \text{[Debtor consumption]} \qquad (4)$$

$$c_{2,t} = a_2[[1-z]y_{t-1} + S_t - \Delta D_t]$$

$$0 < a_2 < 1, a_1 > a_2 \qquad \text{[Creditor consumption]}$$

$$[1-z]y_t + S_t - \Delta D_t > 0 \qquad (5)$$

$$\Delta D_t = D_t - D_{t-1} \qquad \text{[Borrowing]} \qquad (6)$$

$$D_t = a_3 z y_{t-1} \qquad a_3 > 0 \qquad \text{[Debt ceiling]} \qquad (7)$$

$$S_t = rD_{t-1} \qquad \text{[Debt service payments]} \qquad (8)$$

y = level of real output, c_1 = real consumption of debtor households, c_2 = real consumption of creditor households, a_0 = autonomous expenditures, a_1 = MPC of debtor households, a_2 = MPC of creditor households, z = share of income received by debtor households, r = real interest rate, ΔD = change in the level of real debt, S = level of real interest service payments on debt, and D = level of real debt of debtor households. Subscripts represent dates, with the subscript t referring to current period outcomes.

Equation (3) has current period output being determined by AD, which depends on consumption of debtor and creditor households and autonomous expenditures. Equation (4) determines consumption of debtor households, which depends on income adjusted for debt service payments plus borrowing. All borrowing is spent. Equation (5) determines consumption of creditor households, which depends on income adjusted for debt service receipts less lending. This adjusted income is restricted to be positive. Debtor households are assumed to have a higher marginal propensity to consume than creditor households. Equation (6) defines the change in the level of debt.

Equation (7) describes the relation between debt and income. The coefficient a_3 represents the debt–income leverage ratio. There are two possible interpretations of this relation. The first is that last period's income represents the borrower's expectations of current income, in which case the coefficient a_3 represents a desired debt–income ratio. Alternatively, last period income is what lenders observe, and this determines the loan ceiling. In this case the coefficient a_3 represents a debt–income ceiling, and borrowers are implicitly always constrained by this ceiling. Finally, Equation (8) is the debt service equation. Interest is paid in arrears, so that the debt service is based on the last period's debt. The real service burden is the real interest rate multiplied by the real level of debt. The above specification implies that the real interest rate is fixed.

Substituting Equations (4) and (5) into (3) yields a semi-reduced form

$$y_t = b_0 + b_1 y_{t-1} + b_2 \Delta D_t + b_3 S_t \tag{9}$$

where $b_0 = a_0 > 0$; $0 < b_1 = a_1 z + a_2[1–z] < 1$; $0 < b_2 = [1–a_2] < 1$; and $0 > b_3 = [a_2 – a_1] > –1$. Equation (9) provides insight into the dynamics of the model. Aggregate demand depends positively on the last period's income, which affects current consumption. b_1 is the aggregate MPC, which is a weighted average of the MPCs of debtors and creditors, where the weights are income shares. AD also depends positively on changes in the level of debt, ΔD. New borrowing, which increases debt, is expansionary because it finances additional expenditures. Debt repayment, which decreases debt, is contractionary. Borrowers are assumed to spend all their borrowings (that is, have an MPC of unity for borrowed funds). Borrowing therefore increases aggregate demand because it transfers income from low MPC creditor/lender households to higher MPC debtor/borrower households. Debt repayments operate in reverse. Lastly, debt service payments (S) are contractionary, since they transfer income from debtors to creditors. The coefficient b_3 represents the difference between the MPCs of debtors and creditors.[2]

Equation (9) is also instructive of how the process of financialization, described in Chapters 2 and 3, has affected the economy. First, redistribution of income (both profit share and wage bill division), can be thought of as having increased creditor incomes. That has lowered the average propensity to consume (b_1) and weakened the demand-generating process. Second, this weakness can be offset by increased borrowing (ΔD). Third, from Equation (7) it can be seen that the extent of borrowing depends on the debt–income ceiling parameter (a_3), which financialization has increased via product innovation, expanded access to credit, and increased risk taking by financial intermediaries.

Substituting Equations (6)–(8) into Equation (9) yields a standard second-order difference equation in y, given by

$$y_t = b_0 + [b_1 + b_2 a_3 z] y_{t-1} + [b_2 - b_3 r] a_3 z y_{t-2} = A_0 + A_1 y_{t-1} + A_2 y_{t-2} \tag{10}$$

$$A_0 = b_0 > 0, A_1 = [b_1 + b_2 a_3 z] > 0, A_2 = -[b_2 - b_3 r] a_3 z < 0$$

The solution to the particular integral for this equation is

$$y_p = b_0/[1 - b_1 - b_3 a_3 z r] = a_0/\{1 - [a_1 z + a_2[1 - z]] - [a_2 - a_1] a_3 z r\} \tag{11}$$

y_p constitutes the long-run equilibrium level of income to which the economy converges if it is stable.

Differentiating y_p with respect to z, a_3, and r yields

$$\delta y_p/\delta z = -[a_0]\{[a_2 - a_1][1 - a_3 r]/\{\}^2 \gtrless 0 \text{ if } 1 - a_3 r \gtrless 0$$
$$\delta y_p/\delta a_3 = -[a_0]\{-[a_2 - a_1]zr\}/\{\}^2 < 0$$
$$\delta y_p/\delta r = -[a_0]\{-[a_2 - a_1]a_3 z\}/\{\}^2 < 0$$

Increases in debtor households' share of income (z) is expansionary if $a_3 r < 1$, which is almost certainly true for all plausible values of a_3 and r. The logic is that debtor households have a higher marginal propensity to spend, so that increasing their share of income increases AD. However, raising their income also increases their borrowing, which adds a contractionary effect via increased debt service transfers. For equilibrium income to rise as a result of increasing the debtor income share, borrowing must not increase by too much ($a_3 r < 1$).

Increases in the borrowing ceiling (a_3) and the real interest rate (r) both reduce equilibrium income. This is because both of these raise the equilibrium debt service burden of debtor households, which lowers equilibrium AD and output.

These comparative static outcomes help explain the economic difficulties the USA and other developed country economies face in the wake of the financial crisis of 2008. First, financialization has lowered debtor (worker) households' share of income, which has lowered equilibrium AD. This helps explain the persistent demand weakness since the crisis. Second, financialization increased the debt–income ceiling. That increased borrowing, which initially offset the demand weakness caused by worsened income distribution. However, it has ultimately resulted in higher debt burdens that now permanently depress AD. As for interest rates, during the period of boom they were higher so that monetary policy worked to offset the expansionary demand effects of increased borrowing. In the wake of the crisis, monetary policy has lowered rates in an attempt to reduce debt burdens and increase AD, but interest rates are now blocked from falling further by the zero lower bound and unavoidable credit default risks that place a limit on how low they can go.

Finally, there is the issue of stability. The Routh–Hurwicz conditions (see Footnote 16) show that instability is more likely: (i) the greater the marginal impact on spending from new borrowing, b_2; (ii) the greater the allowable debt–income ratio, a_3; (iii) the greater the share of income going to debtors, z; (iv) the greater the net marginal effect of debt service on AD, $|b_3|$; and (v) the higher the real interest rate.[3]

Increases in b_2, a_3, and z increase the multiplier effect of changes in income by generating larger induced expansions of AD through borrowing. This can generate instability by causing explosive expansions

of income, debt, and AD. The same holds for increases in $|b_3|$, which represents the difference in propensity to consume of debtor and creditor households. Financialization has therefore had competing stability impacts. Lowering the debtor share of income has been stabilizing but contractionary, while increasing the allowable debt–income ratio was initially expansionary but ultimately became contractionary and also destabilizing.

4.3.2 A firm debt model of the business cycle

Consumer debt represents one source of transfers between debtors and creditors. However, firms also borrow, which creates another source of transfers that can also generate business cycles. The logic of business debt-driven models of the business cycle (Gallegati and Gardini, 1991; Franke and Semmler, 1991; Skott, 1994) pivots off the empirical findings of Fazzari et al. (1988) that investment spending is positively influenced by the level of firms' internal cash flows. This indicates that firms are subject to finance constraints which are relaxed by increased cash flows and access to borrowing, and the finance constraint opens an avenue for business borrowing and debt to impact investment spending and AD. Cycles can emerge if firms' borrowing capacity is subject to cyclical balance sheet congestion effects that impose cyclical limits on the amount they can borrow to finance investment. Additionally, a debt service transfer mechanism can be incorporated to recognize that indebted firms make payments to households. This effect requires amending the consumption function to take account of household lending to firms and the associated interest income from firms.[4]

These channels are included in the following six-equation model:

$$y_t = c_t + I_t + G \tag{12}$$

$$c_t = \eta_0 + \eta_1\{[1-\varphi]y_{t-1} + [1-\gamma]\varphi y_{t-1} + rD_{t-1}\} - \Delta D_t \qquad \eta_0 > 0, 0 < \eta_1 < 1, \; 0 < \varphi < 1, 0 < \gamma < 1 \tag{13}$$

$$I_t = \alpha_0 + \alpha_1 y_{t-1} + \alpha_2 CF_t \qquad \alpha_0, \alpha_1, \alpha_2 > 0 \tag{14}$$

$$CF_t = \gamma\varphi y_{t-1} - rD_{t-1} + \Delta D_t \tag{15}$$

$$\Delta D_t = D_t - D_{t-1} \tag{16}$$

$$D_t = \Omega\varphi y_{t-1} \tag{17}$$

I = real investment spending, G = government spending, CF = real cash flows available in period t, γ = firms' profit retention ratio, φ = profit share, and ΔD_t = firm borrowing or repayment.

Equation (12) is the goods market clearing condition. Equation (13) is an aggregate consumption function (without consumer borrowing). Aggregate consumption depends on the wage share, $[1 - \varphi]y_{t-1}$; the share of profits paid out as dividends, $[1- \gamma]\varphi y_{t-1}$; debt service income received from firms (rD_{t-1}); and lending to firms (ΔD_t).[5] The important feature is that households now lend to firms and receive interest income from firms. Equation (14) is an investment function in which investment depends on lagged output and available cash flow. Equation (15) determines cash flow which depends on retained profits less interest plus (minus) new borrowing (debt repayment). Equation (16) determines borrowing, and Equation (17) determines firms' debt level. Firms are always at their debt ceiling, which is a multiple of the profit share.

Substitution of Equations (13), (14), (15), (16) and (17) into Equation (12) yields a second-order difference equation, given by

$$\begin{aligned} y_t &= \{\eta_0 + \alpha_0 + G\} + \{\eta_1\{[1-\varphi] + [1-\gamma]\varphi\} + \alpha_1 + \alpha_2\varphi[\gamma + \Omega] - \Omega\varphi\}y_{t-1} \\ &\quad + \{[1-\alpha_2] + [\eta_1 - \alpha_2]r\}\Omega\varphi y_{t-2} \\ &= A_0 + A_1 y_{t-1} + A_2 y_{t-2} \end{aligned} \tag{18}$$

where $A_0 = \eta_0 + \alpha_0 + G > 0$, $A_1 = \{\eta_1\{[1-\varphi] + [1-\gamma]\varphi\} + \alpha_1 + \alpha_2\varphi[\gamma + \Omega] - \Omega\varphi\} > 0$, and $A_2 = \{[1-\alpha_2] + [\eta_1 - \alpha_2]r\}\Omega\varphi > 0$.

With regard to generation of cycles, the same two mechanisms are at work. One is the familiar multiplier-accelerator mechanism (Samuelson, 1939), which works through the effect of income on investment via firms' cash flows. The second is a variant of the predator–prey mechanism that works via transfer of debt service from firms to households. Higher output increases profits, which increases borrowing and debt. However, higher debt reduces free cash flow, which reduces investment and income.

The permanent solution is given by

$$y_p = A_0/\{1 - \{\eta_1\{[1-\varphi] + [1-\gamma]\varphi\} + \alpha_1 + \alpha_2\varphi\gamma]\} - [\eta_1 - \alpha_2]r\Omega\varphi\} \tag{19}$$

Differentiating with respect to firms' debt ceiling, the interest rate and borrowing limit yields

$$\delta y_p/\delta\Omega \gtrless 0 \quad \text{if } \eta_1 \gtrless \alpha_2 \qquad \delta y_p/\delta r \gtrless 0 \quad \text{if } \eta_1 \gtrless \alpha_2$$

Increased debt capacity and higher interest rates both increase equilibrium income if households' propensity to spend exceeds firms'

propensity to invest out of cash flow, and they reduce equilibrium income otherwise.

In the consumer debt model, interest transfers from debtor households to creditor households are unambiguously contractionary because creditors have a lower consumption propensity. The extent to which interest transfers are contractionary depends on the difference in the propensity to consume of creditor and debtor households. However in the firm debt model, the effect can go either way depending on the size of households' propensity to consume relative to firms' propensity to invest from cash flows. Interest transfers from firms to households are contractionary if firms' propensity to invest out of free cash flow exceeds households' propensity to consume. They are expansionary if the opposite holds.

The effect of income distribution on equilibrium output ($\delta y_p/\delta\varphi$) is also ambiguous. Increases in the wage share will tend to be expansionary if households have a high propensity to consume (large η_1) and firms have a low propensity to invest out of cash flow (small α_2). In this case, shifting income to wages adds to consumption but has little impact on investment spending.

Lastly, the parameters η_1 and α_2, representing the propensities to spend of households and firms, are also critical for stability. The Routh–Hurwicz stability conditions are the same as before (see Footnote 8). The critical condition is $1 - A_2 > 0$. This can be violated if η_1 and r are large and α_2 is small. Under these conditions, borrowing by firms raises investment and AD, while firms also make debt service transfers to creditor households that also increase AD. That can produce an explosive outcome, as debt-financed investment spending fuels AD which in turn fuels more debt-financed investment.

4.3.3 A combined model with consumer and firm debt

The above business debt model of the business cycle can be combined with the earlier consumer debt model. However, there are three complications. The first is that rather than having an aggregate consumption function there is a need for separate consumption functions for creditor and debtor households.

The second complication is that corporate ownership must be allocated across debtor and creditor households. The simplest treatment is to assume debtor households have no assets and the corporate sector is entirely owned by creditor households. In that case creditor households receive all dividend and debt service payments from both firms and debtor households. As creditor households have a lower propensity to consume, this also makes it more likely that business interest transfers are contractionary.

The third complication is that the wage bill, $[1 - \varphi]y_{t-1}$, must be allocated across debtor and creditor households. Increases in debtor households' share of the wage bill will be expansionary, and they will also raise the borrowing limit of debtor households.

Since both the pure consumer debt and pure business debt models can produce cycles, so too can a combined model. The balance sheet congestion effects, captured by the debt–income limits, work in the same direction on both households and firms. The debt service transfer mechanism will also work in the same direction if firms' propensity to invest out of free cash flows is greater than creditor households' propensity to consume. The combination of debt service transfer mechanisms can therefore produce cycles of greater amplitude. In sum, debt service transfers, both between households and between firms and households, provide a robust mechanism for generating debt-driven business cycles. This mechanism has great economic common sense and seems especially relevant in light of current real world conditions.

4.4 Financial sector effects on the business cycle

The previous section presented two models in which debt affects AD to create cycles in the goods market. This section explores a range of financial sector mechanisms that can amplify the business cycle by making credit availability more pro-cyclical. Such financial sector mechanisms are particularly associated with the work of Hyman Minsky (1959a, 1959b, 1975, 1982, 1986, 1992).

4.4.1 Asset price and collateral effects

Minsky emphasizes the significance of asset price movements as a force driving the business cycle. Such a feature can be readily incorporated in the above business cycle model by making corporate and household debt ceilings a function of collateral values, with collateral values in turn depending on asset prices. This provides a channel whereby debt ceilings can fluctuate pro-cyclically, making for cycles of greater amplitude.

For the consumer debt model, Equation (7) determining debtor households' debt ceilings can be modified as follows:

$$D_t = \lambda V_t + a_3 z y_{t-1} \quad \lambda > 0 \tag{20}$$

$$V_t = p_t E \tag{21}$$

$$p_t = q\varphi y_{t-1} \quad q > 0 \tag{22}$$

where V = value of debtor household assets, p = price of assets, E = asset units (perhaps equities). Equation (20) determines debt ceilings as a function of collateral values; Equation (21) determines collateral values; and Equation (22) determines asset prices as a multiple of last period profits with φ being the profit share.

Combining (20), (21) and (22) then yields

$$D_t = \lambda V_t + a_3 z y_{t-1} = \lambda q \varphi y_{t-1} E + a_3 z y_{t-1} \tag{23}$$

Now, debt ceilings fluctuate because of pro-cyclical fluctuation in both asset values and debtor household incomes. The asset value effect enables additional borrowing that amplifies the cycle. When the cycle peaks, output declines and the process also goes into reverse with greater force. This reveals the amplification role of financial markets via asset valuation collateral effects.

Just as asset price effects can be incorporated in the consumer debt business cycle model, so too can they be incorporated in the firm debt model. The process is entirely analogous. Thus, firm debt ceilings can be modified to depend on the value of firms' collateral (such as real estate), which also fluctuates pro-cyclically along with general asset prices. This requires modifying firms' debt limit, given by Equation (17), to include an asset value variable. Thus, suppose firms hold a fixed asset such as land (L) which acts as collateral. Firms' debt limit, the value of land holdings, and the price of land can then be described respectively by

$$D_t = \kappa K_t + \Omega \varphi y_{t-1} \quad \kappa > 0 \tag{24}$$

$$K_t = \upsilon_t L \tag{25}$$

$$\upsilon_t = \varepsilon y_{t-1} \qquad \varepsilon > 0 \tag{26}$$

Combining Equations (24)–(26) then yields

$$D_t = \kappa \varepsilon y_{t-1} L + \Omega \varphi y_{t-1} \tag{27}$$

Once again, there is a pro-cyclical asset price effect on the debt ceiling operating via a collateral effect.

Another, more complicated, way of introducing collateral effects is to model collateral in terms of firms' capital stock. That stock will in turn be driven by investment spending and depreciation, with investment depending on income and borrowing. Since investment spending is pro-cyclical, the capital stock and collateral will also exhibit pro-cyclicality, thereby also making firms' borrowing constraint pro-cyclical. This approach is adopted by Kiyotaki and Moore (1997), Bernanke and

Gertler (1996) and Bernanke, Gertler, and Gilchrist (1999). The complication is that it introduces the capital stock as another endogenous stock variable. Consequently, instead of reducing to a single second-order difference equation in output as above, the model becomes a two-equation simultaneous system of second-order difference equations. Such a system can also generate business cycles, but it is mathematically more complicated while adding little extra economic insight.[6]

4.4.2 Financial speculation and irrational exuberance

Another original feature of Minsky's (1982, 1992) work is that financial markets become increasingly speculative over the course of the cycle. In his terminology, financing moves from hedge, to speculative, to Ponzi.[7] This framework resonates closely with the notion of "financial exuberance," made famous by former Federal Reserve Chairman, Alan Greenspan. The Minskian schema can be interpreted as one whereby borrowers become increasingly willing to borrow during cyclical expansions, and lenders become increasingly reckless in their willingness to lend. This psychosocial aspect to borrowing and lending constitutes a supplementary feature that adds psychological richness to the basic debt mechanism.

Such Minskian financial speculation can be incorporated in the debt service transfer model by respecifying the process by which debt ceilings evolve (Palley, 1994). For the household debt model, this involves respecifying Equation (7) so that it becomes

$$D_t = a_3 z y_{t-1} + a_4 z \Delta y_{t-1} \quad a_4 > 0 \tag{7'}$$

where $\Delta y_{t-1} = y_{t-1} - y_{t-2}$. Now, changes in the level of income positively affect the debt–income ceiling through the coefficient a_4. Equation (7′) introduces an additional accelerator effect that operates via the debt ceiling. Its economic logic is that borrowers and lenders become more optimistic in periods of income expansion, enabling increased borrowing. In the original mechanism, given by Equation (7), the debt ceiling fluctuates pro-cyclically but the leverage ratio is constant, whereas in Equation (7′) both the debt ceiling and the leverage ratio fluctuate pro-cyclically, potentially making for cycles of greater amplitude.

Solving the model given by Equations (3), (4), (5), (6), (7′), (8), and (13) yields a third-order difference equation governing the motion of output, given by

$$\begin{aligned} y_t = {} & b_0 + [b_1 + b_2 z[a_3 + a_4]]y_{t-1} - [b_2 z[a_3 + 2a_4] - b_3 a_3 zr - b_3 a_4 zr]y_{t-2} \\ & + [b_2 a_4 z - b_3 a_4 zr]y_{t-3} \end{aligned} \tag{28}$$

Regarding stability properties, the main conclusions are that larger values of b_1, b_2, $|b_3|$, a_3, z, and r, all increase the likelihood of instability for the reasons discussed earlier. Larger values of a_4 also increase the likelihood of instability. The optimism induced by financial exuberance can therefore make for instability, the mechanism being similar to that of a "self-fulfilling" prophecy. In the presence of financial exuberance, increases in income translate into accelerated debt expansion, which generates further income expansion and increased financial exuberance. The reverse holds for income contractions. The addition of an "exuberance" effect operating through a_4 can therefore render a model unstable, vindicating Minsky's (1982) descriptive analysis of the makings of financial crises.[8]

Once again, the same mechanism can be incorporated in the firm debt-driven model of the cycle by respecifying Equation (17) as follows

$$D_t = \Omega_1 \varphi y_{t-1} + \Omega_2 \varphi \Delta y_{t-1} \quad \Omega_1, \Omega_2 > 0 \tag{17'}$$

Now it is lending to firms that is subject to an exuberance effect, with lenders increasing their willingness to lend as profits rise.

Moreover, not only can Minsky's financial exuberance concept be applied to debt ceilings (that is, the willingness of banks to lend), it can also be applied to asset prices and collateral values. Thus, asset prices can be a positive function of changes in output so that Equation (22) becomes

$$p_t = q_1 \varphi y_{t-1} + q_2 \varphi \Delta y_{t-1} \quad q_1, q_2 > 0 \tag{22'}$$

In this case, it is asset markets that are subject to exuberance, and as asset prices rise this provides more collateral that increases borrowing. That in turn further raises income and asset prices, in a manner that can resemble an asset price bubble. Lastly, an alternative formulation that yields a similar impact is to make the coefficient q_1 a positive function of output. However, that also renders the model non-linear.

4.4.3 Gradual adjustment of debt positions

So far it has been assumed that borrowers are always at their debt ceilings. In practice borrowers may adjust slowly to their ceilings, reflecting the fact that it takes time to plan expenditures. In this case debt levels will be governed by a gradual adjustment mechanism such as

$$D_t - D_{t-1} = h[D_t^* - D_{t-1}] \quad 0 < h < 1 \tag{29}$$

D_t^* = desired debt, and h is the coefficient of adjustment. For households, the level of desired debt is the household debt ceiling (Equation (7)). For firms, it is the firm debt ceiling (Equation (17)).

Equation (29) can then be combined with the two core models. For the consumer debt model described above this yields a second-order difference equation determining output, given by

$$y_t = b_0 + [b_1 + b_2 a_3 zh]y_{t-1} + [b_3 r - b_2 h]D_{t-1} \tag{30}$$

$$D_t = ha_3 zy_{t-1} + [1 - h]D_{t-1} \tag{31}$$

In the event that $h = 1$, the model is the same as the basic household debt model. As in that model, increases in b_1 and increases in the absolute value of b_3 both increase the likelihood of instability. Increases in h also increase the likelihood of instability.

Unlike collateral value effects and irrational exuberance effects, gradual adjustment of borrowing is a stabilizing feature of the economy. The logic is that gradual adjustment means that increases in income generate smaller subsequent changes in borrowing and AD, therefore reducing the likelihood of a cumulative unstable expansion. The same holds for contractions in income, with gradual adjustment reducing the likelihood of a cumulative contraction.

4.4.4 Financial institutions and endogenous money

The models described above are akin to loanable funds models of the credit market. Thus, creditors are assumed to lend directly to borrowers, and borrowers make debt service payments directly to creditors. Post Keynesian economics emphasizes that money is endogenously created by banks (Moore, 1988). These features (financial institutions and endogenous money) can be added to the above debt-driven business cycle models and they have two significant effects.[9]

First, adding financial intermediaries (FI) creates a filter between lenders and borrowers. That is because interest payments are made to FIs, and the extent to which they are received by creditor households depends on the distribution policies of FIs. To the extent that FIs pay out less than 100 per cent, this is tantamount to an additional leakage of AD out of the circular flow. However, this leakage can be offset if FIs lend out this interest income.

Second, whereas a loanable funds construction of the credit process views it in terms of transferring existing money balances between lenders and creditors, an endogenous money perspective views the credit process as involving the creation of new money balances. As a result, endogenous

money lending has a larger effect on AD because there is no need for lenders to forgo spending.

Both of these effects are amplifying effects. Endogenous money amplifies the impact of credit creation on AD, while retention of interest payments by banks amplifies the negative AD effect of debt service transfers from debtors to creditors.

Palley (1997a) presents a consumer debt business cycle model with both endogenous bank credit money and a loanable funds credit market. The equations of the model are given by

$$y_t = a_0 + c_{1,t} + c_{2,t} \tag{32}$$

$$c_{1,t} = a_1[zy_{d,t-1} - S_t] + \Delta D_{1,t} + \Delta D_{2,t} \qquad 0 < a_1 < 1, 0 < z < 1 \tag{33}$$

$$c_{2,t} = a_2\{[1-z]y_{d,t-1} + S_t - \Delta D_{2,t}\} \qquad 0 < a_2 < 1, a_1 > a_2 \qquad [1-z]y_{d,t} + S_t - \Delta D_{2,t} > 0 \tag{34}$$

$$y_{d,t} = [1-t]y_t \tag{35}$$

$$\Delta D_{1,t} = D_{1,t} - D_{1,t-1} \tag{36}$$

$$\Delta D_{2,t} = D_{2,t} - D_{2,t-1} \tag{37}$$

$$D_{1,t} = a_3 zy_{d,t-1} + a_4 z\Delta y_{d,t-1} \qquad a_3 > 0, a_4 > 0 \tag{38}$$

$$D_{2,t} = a_5 D_{1,t} \qquad a_5 > 0 \tag{39}$$

$$\Delta y_{d,t-1} = y_{d,t-1} - y_{d,t-2} \tag{40}$$

$$St = r[D_{1,t-1} + D_{2,t-1}] \tag{41}$$

y = level of real output, y_d = after-tax income, c_1 = real consumption of debtor households, c_2 = real consumption of creditor households, a_0 = autonomous expenditures, a_1 = propensity to consume of debtor households, a_2 = propensity to consume of creditor households, z = share of income received by debtor households, t = tax rate, r = real interest rate, ΔD_1 = change in real bank debt (indirect finance), ΔD_2 = change in real credit market debt (direct finance), S = level of real interest service payments on total debt, D_1 = level of real bank debt, D_2 = level of real credit market debt, and Δy_d = change in the level of after-tax real income.

The economic logic is entirely analogous to the earlier model of consumer borrowing. The innovation is the introduction of a distinction

between bank borrowing (ΔD_1) and credit market borrowing (ΔD_2). Bank borrowing and credit market borrowing have differential impacts on consumption of creditors, reflecting the nature of endogenous money. Endogenous credit money allows banks to lend without affecting the consumption of their owners since bank lending creates new money. This contrasts with finance provided directly through credit markets, which involves the transfer of existing money balances from lenders to borrowers.

Inspection of Equations (33) and (34) reveals the more expansionary effect of bank (indirect) finance. Such finance adds a full dollar to aggregate spending, whereas credit market (direct) finance only increases AD by $1 - a_2$, which represents the difference in the propensities to consume of debtors and creditors. Indirect finance creates a dollar of spending, whereas direct finance redistributes a dollar of spending.

Substituting Equations (33) and (34) into (32) yields

$$y_t = a_0 + b_1 y_{d,t-1} + \Delta D_{1,t} + [1 - a_2]\Delta D_{2,t} + b_2 S_t \tag{42}$$

where $b_1 = \{a_1 z + a_2[1 - z]\}$ and $b_2 = [a_2 - a_1] < 0$.

Equation (42) is a semi-reduced form that facilitates understanding the impact of endogenous money. Increases in bank borrowing ($\Delta D_{1,t} > 0$) increase AD dollar for dollar since banks create money that is then spent. These expenditures enter the circular flow of money income and support further economic activity and consumption. The reverse holds for repayments of bank loans which destroy money. Increases in direct finance are also expansionary, but less so than increases in bank lending. Direct finance transfers money income claims from creditors to debtors, and the net increase in AD is equal to the difference in the propensities to consume of debtors and creditors ($[1–a_2]\Delta D_{2,t}$).

The particular solution for the model is given by

$$y^* = a_0/\{1 - b_1[1 - t] + b_2 r[1 + a_5]a_3 z[1 - t]\} \tag{43}$$

Partial differentiation of (43) generates the following comparative static effects: (i) A higher interest rate (r) reduces equilibrium income since it increases the income transfer from debtor to creditor households. (ii) Increases in the allowable debt–income ratios (a_3 and a_5) also reduce equilibrium income, as they increase the debt service burden on debtor households which have a higher propensity to consume. Though borrowing gives an initial boost to AD, this positive effect is dominated in the long run by the increased negative debt stock effect. (iii) Shifts in the distribution of income (z) toward debtor households have an ambiguous

effect on income. On the one hand, shifts in distribution toward debtor households have a positive effect owing to debtors' higher MPC: on the other hand they have a negative debt stock effect by allowing debtors to take on larger equilibrium debt burdens.

As the share of bank debt in total debt increases, the amplitude of the cycle increases and the critical debt–income ratio at which the model becomes unstable falls. Bank debt has a greater impact on the economy, reflecting the fact that it is created without diminishing the disposable income of creditors. Similarly, it is extinguished without increasing the disposable income of creditors. This feature is destabilizing. From a policy standpoint, it suggests that monetary authorities may find it useful to use counter-cyclical regulatory controls that discourage bank lending in booms and encourage bank lending in slumps. This regulatory proposal is examined in Chapters 10 and 11.

4.4.5 Endogenous pro-cyclical interest rates

Another possible extension of the model is inclusion of endogenous pro-cyclical movements of interest rates – perhaps via a leaning against the wind interest rate policy reaction function that has interest rates rise as economic activity increases. Such an interest rate policy can serve to smooth the cycle by offsetting the AD impact of borrowing during the upturn and loan repayments during the downswing. Thus, higher rates during the upturn reduce debtor disposable income at a time when they are borrowing and adding to AD. That tamps down AD and the upward wave of the cycle. Similarly, lower rates in a downturn increase debtors' disposable income at a time when they are repaying debt and lowering AD. That increases AD and limits the downward wave of the cycle.

4.5 Conclusion

Financialization has increased the presence of debt in economies. Debt is a two-edged sword. It is initially expansionary when it is incurred as borrowing is spent. Subsequently, however, the burdens associated with servicing debt are contractionary. This aspect of debt helps explain the tendency to stagnation in the wake of the Great Recession of 2007 to 2009 as many economies are weighed down by accumulated debt burdens.

Economic models including debt are readily capable of generating business cycles. A key parameter is the debt–income ceiling which affects the amplitude of the cycle and is also a parameter that is critically relevant for stability. Financialization has increased the debt–income ceiling via

financial innovation, increased access to credit, increased risk taking by lenders, and expanded forms of collateral. That has increased the amplitude of the cycle and may even have created instability. That would explain the need for more significant policy interventions that create floors and ceilings to fluctuations.

5
Deflation and Inflation Dynamics with Debt

A hallmark of financialization has been massive increase in inside debt (debt contracted between private sector borrowers and lenders).[1] Increased debt has played a critical role within the corporate sector, financing leveraged buyouts and transforming corporate cash flows into interest payments that squeeze workers by limiting financial resources available for wage payments.

Increased debt has also played a critical role in maintaining consumer spending. As discussed in Chapter 2, the economic policy configuration driven by financialization has fostered wage stagnation, widened income inequality, and reduced the wage share of national income. Together, these developments weakened the aggregate demand-generation process and created a demand gap. Consumer debt played a critical role filling that gap by giving households access to borrowing which financed consumer spending.

Inside debt is almost entirely overlooked by mainstream economics owing to its tendency to model the economy in terms of identical representative agents. In contrast, there exists a long tradition in Keynesian economics (Tobin, 1980; Caskey and Fazarri, 1987; Palley, 1991, 1999, 2008a), grounded in Fisher's (1933) debt-deflation theory of depressions, which is very concerned about inside debt. That concern focuses on how debt adversely impacts the ability of market economies to self-adjust to both excess supply and excess demand conditions. In the presence of inside debt, both excess supply and excess demand may trigger price

This chapter draws extensively on material that was first published in "Keynesian models of deflation and depression revisited," *Journal of Economic Behavior and Organization*, 68 (October 2008): 167–77 and as "Inside debt and the stability of inflation," *Eastern Economic Journal*, 37 (4) (2011): 488–507.

level dynamics that push the economy in an unstable direction, of accelerating deflation or accelerating inflation.

This chapter presents a macroeconomic model that augments a seminal paper by Tobin (1975) to include inside debt. The chapter shows how inside debt can render the price mechanism destabilizing and increased price flexibility worsens the problem of instability. Financialization has increased indebtedness and promoted price and nominal wage flexibility so that economies may now be at significant risk of instability.

5.1 The Tobin model revisited

Within the Tobin (1975) model aggregate demand (AD) is determined by a conventional macroeconomic framework, given by

$$E = \varepsilon(y, r, m, Z) \quad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_m > 0, \varepsilon_Z > 0 \tag{1}$$

$$m = m(i, y, \pi^e) \quad m_i < 0, m_y > 0, m_{\pi e} < 0 \tag{2}$$

$$r = i - \pi^e \tag{3}$$

$$m = M/p \tag{4}$$

$\varepsilon(.)$ = aggregate demand function, $m(.)$ = real money demand function, y = level of real income, r = expected real interest rate, m = real money supply, M = nominal money supply, p = price level, i = nominal interest rate, π^e = expected rate of inflation, and Z = autonomous expenditures.

Equation (1) has AD depending positively on income; negatively on the expected real interest rate; positively on real money holdings reflecting the operation of the Pigou (1943) real balance effect; and positively on autonomous expenditures. Equation (2) is the money market clearing condition, and has real money supply equal to real money demand. The demand for real money balances depends negatively on the nominal interest rate, positively on income, and negatively on expected inflation. This latter effect reflects the Tobin (1965)–Mundell (1963) effect whereby higher expected inflation reduces the demand for real money balances. Equation (3) is the definition of the real interest rate, and Equation (4) is the definition of the real money supply.

Combining Equations (1)–(4) yields a general reduced form for AD, given by

$$E = \varepsilon(y, r(\pi^e, m(M, p), y), m(M, p), Z) \quad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_m > 0, \varepsilon_Z > 0, \tag{5}$$

$$r_{\pi e} < 0, r_m < 0, r_y > 0, m_M > 0, m_p < 0,$$

$$= E(y, p, \pi^e, M, Z) \qquad E_y > 0, E_p < 0, E_{\pi e} > 0, E_M > 0, E_Z > 0$$

Higher income increases AD as the income effect is assumed to dominate any induced interest rate effects ($E_y = \varepsilon_y + \varepsilon_r r_y > 0$). A higher price level lowers AD and output via the Keynes real money supply and Pigou real balance effects ($E_p = \varepsilon_r r_m m_p + \varepsilon_m m_p < 0$). Higher expected inflation increases AD and output because it reduces money demand, leading to lower real interest rates that spur spending ($E_{\pi e} = \varepsilon_r r_{\pi e} > 0$).

This model of AD is then placed in a dynamic framework consisting of three dynamic adjustment equations governing the evolution of the state variables – output, inflation, and inflation expectations. Output adjustment is assumed to be governed by the state of excess demand, measured as the gap between current demand and current output. Positive excess demand elicits an expansion of output, while negative excess demand elicits a contraction of output. Price level adjustment is governed by the gap between actual and potential output.

The dynamic adjustment equations are given by

$$g_y = A(E - y) \qquad A_1 > 0 \tag{6.a}$$

$$\pi = B(y - y^*) + \pi^e \qquad B_1 > 0 \tag{6.b}$$

$$g_{\pi e} = C(\pi - \pi^e) \qquad C_1 > 0 \tag{6.c}$$

g_y = rate of change of output, π = rate of inflation, $g_{\pi e}$ = rate of change of inflation expectations, and y^* = full employment or potential output. Equation (6.a) is an output adjustment equation in which output responds positively to excess demand. Equation (6.b) is a natural rate Phillips equation in which inflation is a function of the output gap and inflation expectations. Equation (6.c) determines the adjustment of inflation expectations according to an adaptive principle.

Given the assumption of a constant nominal money supply, the long-run steady-state equilibrium is given by $y = y^*$, $p = p^*$, and $\pi = \pi^e = 0$.[2] Appropriate substitution and linearization around steady-state equilibrium values yields the following set of linearized adjustment equations:

$$\begin{vmatrix} g_y \\ \Delta p \\ g_{\pi e} \end{vmatrix} = \begin{vmatrix} A_1[E_y - 1] & A_1 E_p & A_1 E_{\pi e} \\ B_1 p^* & 0 & p^* \\ C_1 B_1 & 0 & 0 \end{vmatrix} \begin{vmatrix} y - y^* \\ p - p^* \\ \pi^e - 0 \end{vmatrix} \tag{7}$$

The stability conditions are analyzed in the appendix (at the end of Part I). The critical necessary condition for stability, derived by

Tobin (1975), is

$$p^{*}E_{p} + C_{1}E_{\pi e} < 0 \tag{8}$$

This can be termed the "Tobin condition." The term E_p reflects the combined strength of the Pigou and Keynes money supply effects, while the term $E_{\pi e}$ reflects the strength of the Tobin–Mundell effect. The Pigou and Keynes effects capture how changes in the price level change AD by changing the real money supply, which changes money wealth and the real interest rates. The Tobin–Mundell effect captures the effect of changes in expected inflation, which change the demand for money and the demand for goods. Stability requires the Pigou and Keynes effects dominate the Tobin–Mundell effect.

The workings of the model and its stability properties can also be understood through graphical analysis. Equation (5), determining the level of AD, can be represented as a set of iso-AD contours along which income and AD are constant. These iso-AD contours are drawn in [π^{e}, p] space, as shown in Figure 5.1, and they show combinations of the price level (p) and inflation or deflation expectations (π^{e}). The slope of the contours is obtained by differentiating Equation (5) with respect to p and π^{e}, holding income and AD constant, yielding:

$$dp/d\pi^{e} = -E_{\pi e}/E_{p} = -\varepsilon_{r}r_{\pi e}/[\varepsilon_{r}r_{m}m_{p} + \varepsilon_{m}m_{p}] > 0$$

The positive slope of the iso-AD contours reflects the competition between the Keynes and Pigou effects versus the Tobin–Mundell effect. A higher price level decreases AD via the Keynes and Pigou effects. Holding AD constant therefore requires a stronger Tobin–Mundell real interest rate effect operating via more rapid inflation expectations. Lower iso-contours are associated with higher levels of AD, so that $AD_0 > AD_1$.

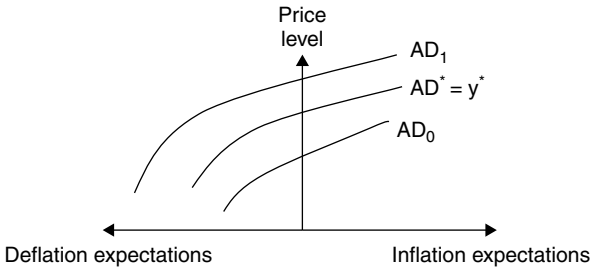

Figure 5.1 Iso-AD contours

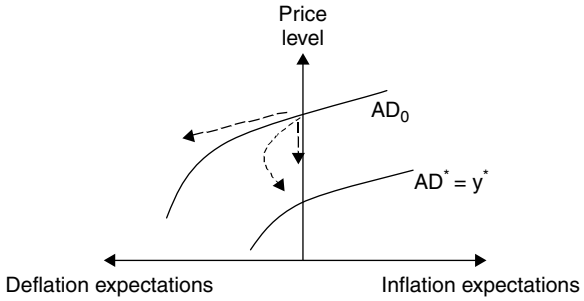

Figure 5.2 Graphical analysis of stability in conditions of excess supply and deflation

The logic is that a lower price level, holding inflation expectations unchanged, increases AD via the Keynes and Pigou effects.

The graphical model can be used to illustrate the pattern of price level adjustment under conditions of both excess supply and excess demand. The former produces deflation while the latter produces inflation. Figure 5.2 shows three different potential price adjustment paths under conditions of excess supply and deflation. One path has prices falling infinitely fast with no impact on deflation expectations. This path corresponds to what Tobin terms Walrasian price adjustment, and along this path AD increases so that the economy moves toward full employment. This price adjustment effect can be captured in the standard ISLM model and corresponds to the case where a lower price level shifts the IS schedule to the right via the Pigou real balance effect, and it shifts the LM schedule down via the Keynes money supply effect. Along this path deflation expectations are zero because the price level jumps instantaneously from the initial level to the new equilibrium level, and then remains unchanged.

The middle price path has prices falling, and deflation expectations initially rising and then falling back to the equilibrium value of zero. This path also leads to higher iso-AD contours so that the economy again moves toward full employment. However, for any given price decline the increase in AD is smaller than the Walrasian path because deflation expectations increase, which increases money demand and real interest rates via the Tobin–Mundell effect. Along this price path the term $C_1E_{\pi e}$ (the potential cause of instability) is dominated by the term p^*E_p.

The third price path has prices falling and deflation expectations continuously rising. Now, the economy is moved to an iso-AD contour

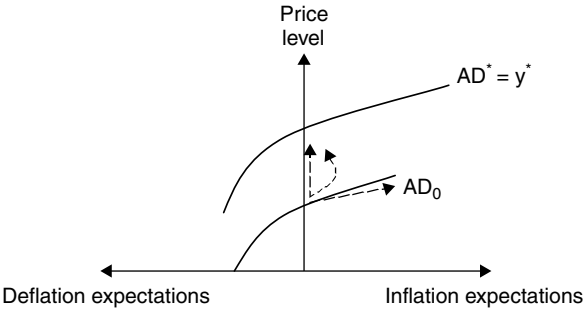

Figure 5.3 Graphical analysis of stability in conditions of excess supply and deflation

with a lower level of AD so that the economy is further away from full employment. This is the case where deflation is destabilizing. The reason is that the Tobin–Mundell effect now dominates the Pigou and Keynes effects.

Figure 5.3 shows three different price adjustment paths for the case of excess demand and inflation. The economy is initially located on the iso-contour AD_0, which corresponds to a position of excess demand ($AD_0 > y^*$). Now, the Walrasian price adjustment path has prices rising infinitely fast, again with no impact on inflation expectations. The jump in the price level decreases AD, closing the output gap and moving the economy instantaneously to non-inflationary full employment. The middle price path has prices increasing and inflation expectations rising gradually. The rising price level causes AD to fall so that the economy moves to a lower iso-AD contour. This closes the gap between AD and output, causing inflation to eventually decline, and the economy again moves toward non-inflationary full employment. Along this path the contractionary effect of a higher price level, operating via the Pigou and Keynes effects, dominates the expansionary effect of higher inflation expectations operating via the Tobin–Mundell effect. Consequently, the inflation process remains stable. The third price path has inflation expectations rising rapidly as the price level increases. Rising inflation expectations increase AD, pushing the economy onto a higher iso-AD contour, increasing the output gap and moving the economy further above full employment. That causes inflation to spiral higher. The reason is the expansionary Tobin–Mundell inflation expectations effect dominates the contractionary Pigou and Keynes price level effects.[3]

5.2 Consumption and investment acceleration and delay effects

The above analysis has expected inflation impacting money demand (Equation (2)), but goods demand is only impacted indirectly, through expected inflation's induced effect on the real interest rate. However, increases in inflation expectations give agents an incentive to accelerate their consumption and investment expenditures in order to avoid higher future prices. Likewise, increases in deflation expectations give agents an incentive to delay consumption and investment expenditures in order to benefit from lower future prices. The microeconomics of such intertemporal substitutions of expenditure has been explored by Neary and Stiglitz (1983).

Consumption and investment acceleration and delay effects can be readily included in the AD function by respecifying it as follows

$$E = \varepsilon(y, r, \pi^e, m, Z) \quad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_{\pi e} > 0, \varepsilon_m > 0, \varepsilon_Z > 0 \tag{9}$$

Now, expected inflation enters as a separate argument in the AD function. Increases in expected inflation have a direct positive impact on AD, while increases in deflation expectations have a direct negative impact on AD.

The macroeconomics of expenditure acceleration and delay effects is easily understood in terms of the familiar ISLM diagram. A jump in inflation expectations will increase investment and consumption spending and reduce saving, shifting the IS schedule right. The expenditure acceleration effect therefore supplements the Tobin–Mundell effect that reduces money demand and shifts the LM schedule down. The reverse holds for deflation and expenditure delay effects, which shift the IS schedule left and the LM schedule up.

Substituting for the real interest rate and real money supply yields a reduced form AD function, given by

$$\begin{aligned} E = {} & \varepsilon(y, r(\pi^e, m(M, p), y), \\ & \pi^e, m(M, p), Z) && \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_{\pi e} > 0, \varepsilon_m > 0, \varepsilon_Z > 0, \\ & && r_{\pi e} < 0, r_m < 0, r_y > 0, m_M > 0, m_p < 0, \\ = {} & E(y, p, \pi^e, M, Z) && E_y > 0, E_p < 0, E_{\pi e} > 0, E_M > 0, E_Z > 0 \end{aligned} \tag{10}$$

The partial derivatives E_y and E_p are unchanged from before. However, the partial derivative for $E_{\pi e}$ becomes $\varepsilon_r r_{\pi e} + \varepsilon_{\pi e}$. This is larger in absolute value owing to the additional term $\varepsilon_{\pi e}$. That increases the likelihood of

instability by making it more likely that the Tobin stability condition (Equation (8)) is violated. The logic is that expenditure acceleration and delay effects augment the destabilizing Tobin–Mundell effect.

In terms of Figure 5.1, expenditure acceleration and delay effects steepen the slope of the iso-AD contours, which now becomes

$$dp/d\pi^e = -[\varepsilon_r r_{\pi e} + \varepsilon_{\pi e}]/[\varepsilon_r r_p + \varepsilon_p] > 0$$

The slope increases because of the new term, $\varepsilon_{\pi e} > 0$, which increases the value of the numerator. The economic logic of steeper iso-AD contours is that increased inflation expectations now have a stronger positive impact on AD because of expenditure acceleration effects, calling for a higher price level to maintain a constant level of AD along each iso-contour. Similarly, increased deflation expectations now have a stronger negative impact on AD, calling for a lower price level to maintain a constant level of AD along each iso-contour.

Steepening the iso-AD contours means that instability is more likely, as some previously stable price adjustment paths become unstable. The stability of the inflation and deflation process therefore depends on the responsiveness of consumption and investment spending to expected inflation and expected deflation. The greater that responsiveness, measured by the magnitude $\varepsilon_{\pi e}$, the greater the likelihood of instability.

5.3 The effect of inside debt

Tobin's (1975) original analysis of the potential instability of deflation ignored the presence of inside debt effects operating on debtors and creditors. In effect, the implicit assumption was that any economic effects simply wash out, the impacts on creditors being offset by equal and opposite impacts on debtors, thereby providing a justification for ignoring the distinction between debtors and creditors.

In his analysis of the Great Depression, Fisher (1933) argued that lower prices affect debtors and creditors asymmetrically. Lower prices increase real debt burdens of debtors while increasing the real value of debts owed to creditors by an identical amount. However, because debtors have a higher marginal propensity to spend than creditors, the redistribution of wealth from debtors to creditors lowers AD. The reverse happens with a higher price level, which redistributes wealth from lower propensity to consume creditors to higher propensity to consume debtors.

The above Fisher debt effect, operating through the price level, can be included in Tobin's (1975) model of deflation and it dramatically

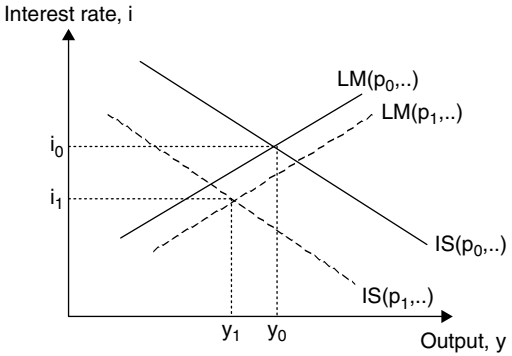

Figure 5.4 The effect of a lower price level in the ISLM model for the case when the Fisher debt effect dominates the combined Keynes and Pigou effects

enhances the analytic richness of the model. The reason is that it potentially changes the sign of the response of AD to changes in the price level, which in turn has enormous significance for the issue of macroeconomic stability. Thus far, the assumption has been that a lower price level increases AD via the Keynes real money supply and Pigou real balance effects, so that $E_p < 0$. Introducing a Fisher debt effect can reverse this signing, so that $E_p > 0$. The necessary condition is that the Fisher debt effect dominates the combined Keynes money supply and Pigou real balance effects.

The macroeconomics of the Fisher debt effect is readily captured in the conventional ISLM diagram shown in Figure 5.4. A lower price level shifts the LM downward via the Keynes effect. It also shifts the IS right via the Pigou real balance effect. However, balanced against that, the Fisher debt effect shifts the IS left. If this leftward shift of the IS is sufficiently strong, as shown in Figure 5.4, AD and output fall.

The Fisher debt effect also operates in an environment of inflation and rising prices, only in reverse. Now, a higher price level reduces the debt service burden of debtors, positively impacting AD owing to the higher marginal propensity to spend of debtors. If the Fisher debt effect dominates the combined Pigou and Keynes real money supply effects, a higher price level can increase AD.

The Fisher debt effect dramatically changes the macroeconomic analysis of price level change, potentially reversing conventional understandings about the relation of AD and the price level. It explains why debt and, therefore, financialization are so important. These macroeconomic

impacts are readily understood in an augmented version of Tobin's (1975) model that includes debt. The inclusion of inside debt changes the AD function, which is now given by

$$E = \varepsilon(y, r, \pi^e, m, d, Z) \quad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_{\pi e} > 0, \varepsilon_m > 0, \varepsilon_d < 0, \varepsilon_Z > 0 \tag{11}$$

$$d = D/P \tag{12}$$

d = level of real inside debt, D = level of nominal inside debt. The partial derivative with respect to real debt, ε_d, is negative, reflecting the Fisher debt effect. Equation (15) defines the level of real inside debt.

Substituting the real interest rate, real money supply, and real inside debt into Equation (11) then yields the following AD function

$$\begin{aligned} E &= \varepsilon(y, r(\pi^e, m(M,p), y), \\ &\quad \pi^e, m(M,p), d(D,p)) \quad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_{\pi e} > 0, \varepsilon_m > 0, \varepsilon_d < 0 \\ &\qquad r_{\pi e} < 0, r_m < 0, r_y > 0, m_M > 0, m_p < 0, d_D > 0, d_p < 0 \\ &= E(y, p, \pi^e, M, D) \qquad E_y > 0, E_p \gtrless 0, E_{\pi e} > 0, E_M > 0, E_D < 0 \end{aligned} \tag{13}$$

With regard to mathematical stability analysis, including the Fisher debt effect changes the parameter E_p, which becomes $\varepsilon_r r_m m_p + \varepsilon_m m_p + \varepsilon_d d_p$. There is now an additional term in this expression ($\varepsilon_d d_p$) that is unambiguously positive, offsetting the other terms and increasing the value of E_p. That makes it more likely that the Tobin stability condition ($p^* E_p + C_1 E_{\pi e} < 0$) is not satisfied. In economic terms, the Fisher debt effect counters the stabilizing Pigou and Keynes effects, making instability more likely.[4]

The question of stability can again be analyzed with the help of the iso-AD diagrams. Differentiating Equation (13) with respect to π^e and p yields the slope of the iso-AD contour, which is given by

$$dp/d\pi^e = -E_{\pi e}/E_p = -[\varepsilon_r r_{\pi e} + \varepsilon_{\pi e}]/[\varepsilon_r r_m m_p + \varepsilon_m m_p + \varepsilon_d d_p] \gtrless 0$$

There are two cases. The first is when the Fisher debt effect is dominated by the Pigou and Keynes effect so that a higher price level still lowers AD, ($E_p < 0$). The second is when the Fisher effect dominates the Pigou and Keynes effects so that a higher price level increases AD, ($E_p > 0$).

Case one. In this case the Fisher debt effect is non-dominant, so that $E_p < 0$ and the iso-AD contour remains positively sloped. However, since the term $\varepsilon_d d_p > 0$, the denominator is smaller in absolute value. That means the slope of the iso-AD contour is larger compared to when there is no Fisher debt effect. This increase in slope is because higher prices have a smaller restraining impact on AD owing to the Fisher debt

effect, so that increased inflation expectations (which increase AD) need a larger compensating increase in the price level to hold AD constant along the iso-contour. The steeper slope means that the set of stable price adjustment paths shrinks, so that inclusion of inside debt increases the parameter space of instability. Lastly, the likelihood of instability depends on the real level of inside debt, D, which enters the expression for the slope of the iso-AD contour. Higher real debt levels therefore increase the likelihood of instability.

Case two. In this case the Fisher debt effect, $\varepsilon_d d_p$, dominates the Pigou and Keynes effects so that $E_p > 0$. Consequently, the slope of the iso-AD contour changes sign and is unambiguously negative. Furthermore, the rank ordering of iso-AD contours is reversed, so that higher contours are associated with lower levels of AD. The logic of this reversal is that a lower price level raises debt burdens and lowers AD so that a higher rate of expected inflation is needed to induce a more expansionary Tobin–Mundell effect.

Figures 5.5 and 5.6 show the case where the Fisher debt effect dominates, so that the iso-AD contours are negatively sloped. Now, both deflation and inflation are unambiguously unstable, with all price adjustment paths leading in the wrong direction. In the case of deflation, a lower price level takes the economy to a lower iso-AD contour. In the case of inflation, a higher price level takes the economy to a higher iso-AD contour. Even if there is Walrasian-style instantaneous price adjustment, with the price level rising without any impact on deflation or inflation expectations, AD still changes in the wrong direction and the process of price adjustment remains unstable. A lower price level worsens excess supply conditions in situations of deflation, and it worsens excess demand conditions in situations of inflation. This instability is

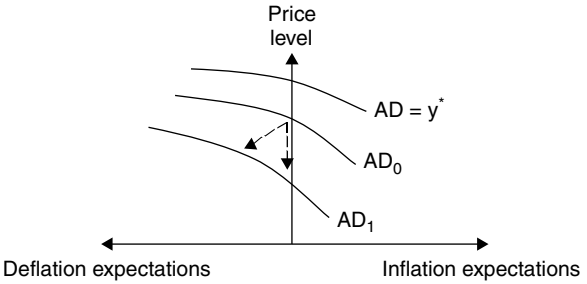

Figure 5.5 Graphical analysis of instability of deflation due to dominance of the Fisher debt effect

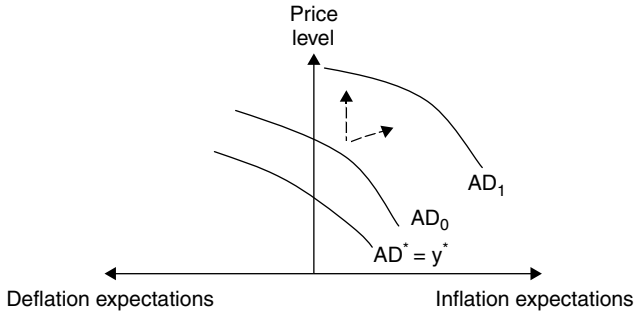

Figure 5.6 Graphical analysis of instability of inflation due to dominance of the Fisher debt effect

confirmed by inspection of the Tobin condition, which can never hold when $E_p > 0$.

5.4 The destabilizing effects of the neoliberal labor market flexibility agenda

Financial neoliberalism also pushes a labor market flexibility agenda aimed at making nominal wages and prices more flexible. In the 1980s there was a flurry of interest in whether increased price flexibility is stabilizing. Two important papers by De Long and Summers (1986) and Caskey and Fazzari (1987) explored this issue, and both concluded that increased price flexibility could be destabilizing. These price flexibility concerns can also be incorporated in the Tobin framework.

Price flexibility can be identified with the function B(.) in Equation (6.b) that determines the sensitivity of inflation to the output gap. Recall the Tobin condition for stability is $p^*E_p + C_1E_{\pi e} < 0$. The partial derivative B_1 does not appear in this condition, implying that the degree of price flexibility is irrelevant for the stability of the system. As originally constructed, the Tobin model therefore has nothing to say about the degree of price flexibility. The implication is that increased price flexibility will not undermine stability. Consequently, if the system is stable, increased price flexibility is desirable, as it will speed up the return to full employment equilibrium.

The reason why price flexibility does not matter in the Tobin model is that expectations are purely adaptive, which means that current developments regarding prices do not affect behaviors regarding either money demand or spending.

This weakness in the model can be remedied by introducing what can be termed near-rational adaptive expectations. According to this specification, agents are concerned not only about the expected level of inflation but also about the direction in which inflation expectations are headed. This adds an additional piece of important information. Such a formulation results in the following respecification of the AD and money demand functions:

$$E = \varepsilon(y, r, m, g_{\pi e}, Z) \quad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_m > 0, \varepsilon_g > 0, \varepsilon_Z > 0 \tag{14}$$

$$m = m(i, y, \pi^e, g_{\pi e}) \quad m_i < 0, m_y > 0, m_{\pi e} < 0, m_g < 0, \tag{15}$$

$g_{\pi e}$ = rate of change of inflation expectations. Both the AD and money demand functions now depend on how fast inflation expectations are changing, as captured by the term $g_{\pi e}$. Combining Equations (14) and (15) then generates a reduced form, given by

$$\begin{matrix} & + & - & - & - & - & + & + & + & + & + \\ E = & \varepsilon(y, & i(\pi^e, & g_{\pi e}, & M/p, & y) - \pi^e, & M/p, & g_{\pi e}, & Z) & & \end{matrix} \tag{16}$$

$$= E(y, \pi^e, g_{\pi e}, Z) \qquad E_y > 0, E_{\pi e} \gtrless 0, E_g > 0, E_Z > 0$$

If inflation expectations are rising, ($g_{\pi e} > 0$), this further reduces money demand and further lowers the nominal interest rate. In effect, it strengthens the Tobin–Mundell effect. Additionally, accelerating inflation gives agents an incentive to bring forward their consumption and investment expenditures to avoid higher future prices. Anticipations of accelerated inflation therefore raise AD via enhanced Tobin–Mundell and expenditure acceleration effects. This effect works in the opposite direction, and lowers AD with regard to anticipations of accelerated deflation.

The dynamics of the model remain governed by Equations (6.a)–(6.c). Substituting (16) into (6.a), and using a linear approximation for $g_{\pi e} = C_1 B_1 \pi^e$, the dynamic model can be linearized around its steady-state equilibrium values to yield

$$\begin{matrix} & + + & & + - & + + & + + + \\ |g_y| & |A_1[E_y - 1] & A_1 E_p & A_1[E_{\pi e} + E_g C_1 B_1]| & [y - y^*] \end{matrix} \tag{17.a}$$

$$\begin{matrix} & + + & & & + & \\ |\Delta p| = & |B_1 p^* & 0 & & p^* & |[p - p^*] \end{matrix} \tag{17.b}$$

$$\begin{matrix} & + + & & & \\ |g_{\pi e}| & |C_1 B_1 & 0 & 0 & |[\pi^e - 0]. \end{matrix} \tag{17.c}$$

The modified Tobin condition for stability is then given by $p^*E_p + C_1[E_{\pi e} + E_g C_1 B_1] < 0$. The Tobin–Mundell effect ($E_{\pi e}$) is now augmented by a near-rational adaptive expectations effect ($E_g C_1 B_1$) that reflects whether the rate of deflation is accelerating or decelerating. The term in the square parentheses is now larger and more positive, making it more likely that the stability condition is not satisfied. Now, both the sensitivity of inflation expectations and the sensitivity of inflation to the output gap matter, and they feed through in a compound fashion.

The economic logic is simple. In deflationary conditions, the more flexible prices are, the greater the current response of deflation expectations to excess supply. This response of deflation expectations is then picked up through the near-rational adaptive expectations mechanism to augment the Tobin–Mundell effect and the expenditure delay effect. In inflationary conditions, the more flexible prices are, the greater the response of inflation expectations to excess demand. This inflation expectations response is then picked up through the near-rational adaptive expectations mechanism to augment the Tobin–Mundell and expenditure acceleration effects. To the extent that financial neoliberalism has increased price flexibility, it has increased the likelihood that the economy is unstable.

5.5 Debt stock-flow effects

Macroeconomics traditionally assumes stocks are fixed. In the original Tobin model the nominal money supply is fixed, and in the debt-augmented model developed above, both the nominal money supply and nominal debt are fixed. Allowing financial stocks to vary adds additional dynamics that impact the likelihood of instability. This penultimate section expands the Tobin model to incorporate debt stock-flow dynamics.

The critical innovation is the introduction of new borrowing and repayment of existing debt. When the economy expands agents may borrow more, which increases the debt stock. When the economy shrinks agents may repay debt, which lowers the debt stock. This gives rise to two additional effects. The first is a debt stock effect that is stabilizing. Since debt stocks and debt burdens fall in recession owing to loan repayment, that assists AD and diminishes deflation. Likewise, since debt stocks and debt burdens rise in expansions, this diminishes AD and restrains inflation. The second is a debt flow effect from borrowing and repayment that is destabilizing. New borrowing adds to AD in expansions,

which contributes to further expansion. Debt repayment reduces AD in contractions, which deepens recessions.

Let the rate of change in the level of nominal debt be given by

$$R = R(kpy - D) \quad R(0) = 0, R_1 > 0 \tag{18}$$

kpy = target level of nominal debt with k > 0. Borrowing is negative (that is, there is repayment) when debt is above target, and it is positive when debt is below target. A lower price level reduces real borrowing by reducing nominal income relative to existing nominal debt.

Additionally, the level of AD is positively affected by new borrowing that increases spending, and it is negatively impacted by debt repayment that reduces spending. This effect can be captured by modifying the AD function to incorporate borrowing and debt repayment effects as follows:

$$\begin{aligned} E &= \varepsilon(y, r, \pi^e, m, d, R, Z) \\ &= \varepsilon(y, i(\pi^e, m(M, p), y) - \pi^e, \pi^e, m(M, p), d(D, p), R(kpy - D), Z) \\ &\qquad \varepsilon_y > 0, \varepsilon_r < 0, \varepsilon_{\pi e} > 0, \varepsilon_d < 0, \varepsilon_R > 0, \varepsilon_m > 0 \\ &\qquad r_{\pi e} < 0, r_m < 0, r_y > 0, m_M > 0, m_p < 0 \\ &\qquad d_D > 0, d_p < 0, R_k > 0, R_p > 0, R_y > 0, R_D < 0 \end{aligned} \tag{19}$$

The partial derivatives are given by

$$E_y = \varepsilon_y + \varepsilon_y r_y + \varepsilon_R R_1 kp = E_y + \varepsilon_R R_1 kp > 0$$

$$E_p = \varepsilon_r r_m m_p + \varepsilon_m m_p + \varepsilon_d d_p + \varepsilon_R R_1 ky = E_p + \varepsilon_R R_1 ky \gtrless 0$$

$$E_{\pi e} = \varepsilon_r r_{\pi e} + \varepsilon_{\pi e} > 0$$

$$E_D = \varepsilon_d d_D - \varepsilon_R R_1 = E_D - \varepsilon_R R_1 < 0$$

The effect of income on AD (E_y) is now increased by a new borrowing effect ($\varepsilon_R R_y$). The effect of a lower price level on aggregate demand (E_p) is also further compromised. There are the standard Keynes and Pigou effects, whereby a lower price level increases AD. There is the Fisher debt effect whereby a lower price level reduces AD by increasing existing debt burdens. Additionally, there is now a price level borrowing effect ($\varepsilon_R R_p$) whereby a lower price level reduces new borrowing and its contribution to AD. The effect of expected inflation on AD ($E_{\pi e}$) is unchanged and consists of the Tobin–Mundell effect and the expenditure acceleration effect. Lastly, the negative effect of increased indebtedness on AD (E_D) is enhanced by the debt repayment effect ($\varepsilon_R R_D$).

Combining Equation (22) with Equations (5.a)–(5.c), the system of dynamic adjustment is now described by the following four equations

$$g_y = A(E - y) \qquad A_1 > 0 \tag{20.a}$$

$$\pi = B(y - y^*) + \pi^e \qquad B_1 > 0 \tag{20.b}$$

$$g_{\pi e} = C(\pi - \pi^e) \qquad C_1 > 0 \tag{20.c}$$

$$R = R(kpy - D) \qquad R_1 > 0 \tag{20.d}$$

The long-run equilibrium is given by $y = y^*$, $p = p^*$, $\pi = \pi^e = 0$ and $D = kp^*y^*$. Appropriate substitution and manipulation, combined with linearization around steady-state equilibrium values, yields a new set of linearized adjustment equations:

$$\begin{vmatrix} g_y \\ \Delta p \\ g_{\pi e} \\ R \end{vmatrix} = \begin{vmatrix} A_1\{[E_y - 1] + \varepsilon_R R_1 kp^*\} & A_1\{E_p + \varepsilon_R R_1 ky^*\} & A_1 E_{\pi e} & A_1[E_D - \varepsilon_R R_1] \\ B_1 p^* & 0 & p^* & 0 \\ C_1 B_1 & 0 & 0 & 0 \\ R_1 kp^* & R_1 ky^* & 0 & -R_1 \end{vmatrix} \begin{vmatrix} y - y^* \\ p - p^* \\ \pi^e - 0 \\ kp^*y^* - D \end{vmatrix} \tag{21}$$

The necessary and sufficient stability conditions of this four-dimensional system are analytically intractable. However, the weaker necessary conditions can be analyzed (see the appendix, at the end of Part I), and those conditions provide substantial insight into the economic impact and significance of debt stock and flow effects.

One necessary condition for stability is that $A_1\{[E_y - 1] + \varepsilon_R R_1 kp^*\} - R_1 < 0$. The term $\varepsilon_R R_1 kp^*$ is positive, making it more likely that this condition is not satisfied. This term reflects the impact of new borrowing on AD, and it shows analytically how new flows of borrowing and debt repayment increase the likelihood of instability. The economic logic is simple. Consider a positive demand shock that creates excess demand and raises nominal income. That in turn induces agents to borrow more, which they then spend and thereby further increase excess demand. The exact opposite holds in deflationary downturns when debt repayments reduce spending and exacerbate the demand shortage, potentially leading to a cumulative contraction of spending caused by deleveraging. In effect, spending flows financed by borrowing potentially compromise the standard Keynesian stability condition that the expenditure multiplier be less than unity.

That said, it is also the case that the term $-R_1$ is negative, which helps with stability. This reflects a debt stock effect whereby rising indebtedness reduces fresh borrowing, thereby reducing the chance of cumulative expansions financed by borrowing. Similarly, debt repayments lower the debt stock, thereby reducing the chance of cumulative contractions caused by loan repayments. Thus, stability will depend in part on whether the destabilizing "flow borrowing effect" dominates the stabilizing "debt stock effect."

A second necessary condition for stability is that the determinant of the Jacobian coefficient matrix have the sign $(-1)^4 > 0$. This yields the condition $E_p + ky^* E_D < 0$. The economic logic behind this condition is also clear. If the Pigou and Keynes effects dominate the Fisher debt effect, then $E_p < 0$ and stability is more likely. If, however, the Fisher debt effect dominates, then $E_p > 0$ and instability is more likely. However, instability is no longer automatic when the Fisher debt effect dominates owing to the stabilizing debt stock adjustment effect, E_D. When the debt stock can adjust there are two components to debt. The first is the conventional Fisher debt effect, which is a price level effect. That effect is unambiguously destabilizing and is included in the term E_p. The second is a debt volume effect, which is a stock effect. This latter effect is reflected in the term E_D and is stabilizing. The logic is borrowing in expansions increases debt, which curtails further expansion by lowering future AD. Conversely, debt repayment lowers debt which helps end the downturn by increasing future AD.

5.6 Endogenous money and the elasticity of finance

Finally, the model also allows consideration of the impact of the Post Keynesian theory of endogenous money (Coghlan, 1978; Moore, 1988). According this theory the money supply is credit-driven, and it can be represented in terms of a loan multiplier as follows

$$M = zD \quad z \geq 1 \tag{22}$$

This implies the real money supply is given by

$$m = zd \tag{23}$$

The coefficient z can be thought of as representing the elasticity of finance, which has increased with financialization.

Substituting Equation (26) into Equation (22) yields a new AD function, given by

$$E = \varepsilon(y, i(\pi^e, zd, y) - \pi^e, \pi^e, zd, d, R, Z) \tag{24}$$
$$= \varepsilon(y, i(\pi^e, zd(D, p), y) - \pi^e, \pi^e, zd(D, p), d(D, p), R(kpy - D), Z)$$

The important feature of Equation (24) is the interest rate, the money supply, and debt are all linked. With the real money supply now endogenous and driven by lending changes, the partial derivatives of the AD function with respect to p and D are

$$E_p = \varepsilon_r zd_p + \varepsilon_m zd_p + \varepsilon_d d_p + \varepsilon_R R_1 ky = E_p' + \varepsilon_R R_1 ky \gtrless 0$$

$$E_D = \varepsilon_r r_m zd_D + \varepsilon_m zd_D + \varepsilon_d d_D - \varepsilon_R R_1 = E_D' - \varepsilon_R R_1 \gtrless 0$$

The Keynes ($\varepsilon_r zd_p$) and Pigou ($\varepsilon_m zd_p$) money supply effects are now induced via the effect of the price level on real debt. More importantly, the sign of E_D is now ambiguous, so that increases in debt can increase AD because of the new terms $\varepsilon_r r_m zd_D$ and $\varepsilon_m zd_D$. This is because increased debt increases the money supply, which adds to AD via a Keynes money supply and Pigou real balance effect. That increases the likelihood of instability.

Linking debt and the money supply changes the element a_{14} of the Jacobian coefficient matrix to $A_1[E_D' - \varepsilon_R R_1]$. This in turn alters the necessary condition for stability to $E_p' + ky^* E_D' < 0$. Since $E_D' > E_D$, this makes instability more likely.

The economic logic for this destabilizing proclivity of endogenous money is simple. With endogenous money, increased debt increases the money supply and expands real balances. That increases AD and income, which in turn spurs more borrowing. If this effect is large enough it can make the model unstable by causing a cumulative expansion of income and borrowing or a cumulative contraction of income and debt repayment.

This challenge is compounded if borrowing has become more sensitive to expected inflation owing to financial innovation and deregulation. In this case, borrowing is described by

$$R = R(k(\pi^e)py - D) \quad R_1 > 0, k_{\pi e} > 0 \tag{25}$$

Substituting Equation (25) into Equation (24) then yields

$$E = \varepsilon(y, i(\pi^e, zd(D, p), y) - \pi^e, \pi^e, zd(D, p), d(D, p), R(k(\pi^e)py - D), Z) \tag{26}$$

Differentiating with respect to expected inflation yields

$$E_{\pi e} = \varepsilon_r r_{\pi e} + \varepsilon_{\pi e} + \varepsilon_R R_1 pyk_{\pi e} > 0$$

Increased sensitivity of borrowing to expected inflation ($k_{\pi e}$) therefore increases the positive impact of expected inflation on AD, which is equivalent to augmenting the destabilizing Tobin–Mundell effect.

5.7 Implications of financialization for monetary policy

The inclusion of nominal debt shows how the macro economy can become unstable in the face of excess supply or excess demand conditions. In highly indebted environments, excess demand conditions that increase the price level can increase AD through erosion of debt burdens, causing the inflation process to accelerate rapidly. Conversely, in excess supply conditions a lower price level can lower AD, causing the deflation process to accelerate.[5] This potential for instability is increased by the presence of endogenous money.

Financialization has increased both levels of debt and the elasticity of finance and the money supply. These developments have increased the likelihood of economic instability. Monetary authorities may now confront a "knife-edge," maneuvering between unstable deflationary and inflationary paths. When hit by deflationary shocks, the monetary authority must react quickly to head off the prospect of an unstable deflationary price adjustment path. However, if policy is successful in heading off deflation and moving to an inflationary adjustment path, monetary policy must then react quickly to head off the prospect of an unstable inflationary price adjustment path.

Such analysis resonates with current conditions and helps explain recent Federal Reserve policy. The US economy now (2012) has much higher inside debt ratios than in the past. When deflation threatened in the period 2001 to 2003, the Fed lowered interest rates much more sharply than was historically warranted according to headline macroeconomic numbers. The reason for this sharp lowering of interest rates was to stave off a potentially unstable deflation. However, it was so successful that it triggered the possibility of an unstable inflation, which explains why the Fed shifted to steady interest rate raising mode over the period 2004 to 2007. That in turn may have pushed the economy back into deflationary mode, prompting rapid interest rate reductions over the period 2007 to 2008. However, the capacity to lower interest rates further is now restricted by the zero lower bound to nominal rates.

Looking to the future, these developments suggest conduct of monetary policy will be more difficult owing to the new environment of high inside debt levels that may have rendered the economy unstable. However, instability can be countered by having an interest rate reaction function that vigorously increases interest rates in response to higher expected inflation and vigorously lowers them in response to expected deflation.

The macroeconomic instability problem posed by inside debt also has implications for microeconomic policy. In the presence of a dominant Fisher debt effect, price level adjustment no longer acts as an automatic stabilizer that chokes off demand under inflationary conditions or increases demand under deflationary conditions. Instead, price level adjustment becomes an automatic destabilizer by either eroding debt burdens in inflationary times or augmenting them in deflationary times. That suggests that the pursuit of price flexibility as a policy goal is problematic.

Finally, these macroeconomic stability concerns also have implications for financial regulation. Regulation should not only be about controlling risk taking by individual agents and firms, it should also be promote macroeconomic stability. Regulation that imposes leverage ceilings can contribute to restoring macroeconomic stability by limiting borrowing and debt burdens.

Appendix

This section derives the stability conditions for Tobin's (1975) model. The coefficient matrix of Equation (8) in the text is:

$$|J| = \begin{vmatrix} A_1[E_y - 1] & A_1E_p & A_1E_{\pi e} \\ B_1p^* & 0 & p^* \\ C_1B_1 & 0 & 0 \end{vmatrix}$$

Applying the conditions described in Gandolfo (1979, p.274), stability requires

$$A_1[E_y - 1] < 0 \tag{A.1}$$

$$\begin{vmatrix} A_1[E_y - -1] & A_1E_p & A_1E_{\pi e} \\ B_1p^* & 0 & p^* \\ C_1B_1 & 0 & 0 \end{vmatrix} < 0 \tag{A.2}$$

$$\begin{vmatrix} A_1[E_y - 1] & p* & -A_1E_{\pi e} \\ 0 & A_1[E_y - 1] & A_1E_p \\ -C_1B_1 & B_2p^* & 0 \end{vmatrix} < 0 \qquad \text{(A.3)}$$

Condition (A.1) is satisfied because E_y, the marginal propensity to spend, is less than unity by assumption.

Satisfying Condition (A.2) implies $A_1B_1C_1E_pp^* < 0$. This only holds if $E_p < 0$. That shows that if the Fisher debt effect dominates, the model is unambiguously unstable as shown in Section 5.5 of the chapter.

Condition (A.3) implies $A_1[E_1 - 1][C_1E_3 + p^*E_2] + C_1E_2p^* > 0$. This condition can only be satisfied if $[C_1E_{\pi e} + p^*E_p] < 0$, which is the Tobin condition. Moreover, it must be sufficiently negative to offset the other term in the inequality that is negative. Thus, even if the Pigou and Keynes effects dominate ($E_p < 0$) the model can be unstable owing to the Tobin–Mundell effect, and because the Fisher debt effect weakens the Keynes and Pigou effects (that is, it makes E_p less negative).

The coefficient matrix of Equation (21) in the text is:

$$|J| = \begin{vmatrix} A_1\{[E_y - 1] + \varepsilon_R R_1 kp^*\} & A_1\{E_p + \varepsilon_R R_1 ky^*]\} & A_1E_{\pi e} & A_1[E_D - \varepsilon_R R_1] \\ B_1p^* & 0 & p^* & 0 \\ C_1B_1 & 0 & 0 & 0 \\ R_1kp^* & R_1ky^* & 0 & -R_1 \end{vmatrix}$$

Per Gandolfo (1980, pp.277–278), a necessary (but not sufficient) condition for stability is that the trace of $J < 0$. This requires that $A_1\{[E_y - 1] + \varepsilon_R R_1 kp^*\} - R_1 < 0$. The term $\varepsilon_R R_1 kp^*$ is positive, making it more likely this condition is not satisfied.

A second necessary (but not sufficient) condition for stability is that the determinant of |J|has the sign $(-1)^4 > 0$. Evaluating det |J|then yields the following condition

$E_p + ky^*E_D < 0$.

Part II
Financialization and Instability

6
Herd Behavior: Safety in Numbers

The financial crisis of 2008 revealed the fragility of financial systems. One cause of that fragility may have been herd behavior on the part of financial market participants that had all adopted common behaviors and investment strategies. Evidence for such behavior is provided by former Citigroup CEO Chuck Prince's comments about investing in mortgage-backed securities, including sub-prime loans:

> When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you've got to get up and dance. We're still dancing. (*Financial Times*, July 9, 2007)

The house price bubble of the 2000s and its associated loose lending add to other previous episodes of herd behavior. These include the wave of bank lending to less developed countries (LDCs) in the late 1970s and early 1980s, and the wave of commercial property lending in the USA during the latter part of the 1980s – both of which involved Citigroup and left it effectively bankrupt and in need of official support each time, as did the crisis of 2008.

Herd behavior is an important characteristic of financial market behavior that can promote financial instability. It is a microeconomic behavior that connects closely with Minsky's (1982, 1993) macroeconomic financial instability hypothesis, which is examined in Chapter 8. The challenge is to explain herd behavior in a manner that is consonant with rational individual decision making.

Scharfstein and Stein (1990) and Banerjee (1992) have argued that herd behavior is consistent with rational individual decision making on the

This chapter is a revised version of "Safety in numbers: a model of managerial herd behavior," *Journal of Economic Behavior and Organization*, 28 (1995): 443–50.

grounds that the behaviors of others convey information that is valuable in one's own private decision making. Consequently when an individual observes others selecting a particular choice, that person receives information that inclines him or her to make the same choice, thereby generating herd behavior.

This chapter offers an alternative explanation of managerial herd behavior, based on "safety in numbers." This alternative explanation is completely independent of information signaling and matches popular explanations of herd behavior similar to that used by Gwynne (1986, p.58) in explaining international bank lending to LDCs in the early 1980s:

> At the very least, Herrick was simply doing what hundreds of other larger international banks had already done, and any ultimate blame for poor forecasting would be shared by tens of thousands of bankers around the world: this was one of the curious benefits of following the herd.

The model that is developed below shows the conditions under which such patterns of behavior can emerge.

6.1 The model

For simplicity, the explanation of herd behavior is initially developed in a two state of nature–two manager economy. Extension to a world with N managers is discussed later. The key assumptions behind the model are that managers are risk averse and that the rewards paid to managers are affected by their "relative" performance. This latter assumption can be justified on the grounds that managers are assessed on a comparative basis and those that fall short relative to other managers are penalized.[1] There is some theoretical justification for this type of remuneration scheme in the principal–agent literature. According to principal–agent theory, agents should be paid on the basis of their competence and they should not be rewarded or penalized for macroeconomic factors over which they have no control. In concrete terms, the managers of General Motors should be rewarded because they have done a superior job relative to the managers of Ford and Chrysler, and not because there has been a cyclical boom that has positively impacted the entire auto industry.

The formal structure of the model is as follows. Each manager maximizes his personal expected well-being subject to his reward function, available portfolio investment set, and overall resource constraint. The model is most easily illustrated by considering the case of an options fund

manager. In this case, the resource constraint represents the deposits placed with the fund. The manager chooses how to allocate these deposits across an array of possible investment options.

This situation can be illustrated as follows. Manager I seeks to maximize his expected utility which is given by

$$\underset{X_1, X_2}{\text{Max}}\ EU_I = pZ_1^{\alpha} + [1-p]Z_2^{\alpha} \quad 0 < p < 1, 0 < \alpha < 1 \tag{1}$$

$$\text{subject to } X_1 + X_2 = 1 \qquad X_1 > 0, X_2 > 0 \tag{1.a}$$

$$x_1 = [1+r]X_1 \tag{1.b}$$

$$x_2 = [1+r]X_2 \tag{1.c}$$

$$Z_1 = ax_1 + b[x_1 - y_1] \quad a > 0, b > 0 \tag{1.d}$$

$$Z_2 = ax_2 + b[x_2 - y_2] \tag{1.e}$$

EU_I = expected utility of Manager I; p = Manager I's subjectively held belief regarding the probability of State 1; X_i = allocation of resources by Manager I to Investment I where i = 1,2; x_i = revenue earned by Manager I in State i; r = exogenous rate of return on investments; Z_i = payment to Manager I in State i; y_i = revenue earned by Manager II in State i.

Equation (1) is the expected utility function. Equation (1.a) is the resource constraint that gives managers one unit of funds which can be allocated across two options. Equations (1.b) and (1.c) determine the revenues from the options in the two states, while Equations (1.d) and (1.e) determine the reward to Manager I in the two states. The significant feature about these reward functions is that they depend on the revenue earned by Manager II. Consequently, when making investment decisions, Manager I takes account of the investment decisions of Manager II.[2]

Manager II has an entirely symmetric problem, given by

$$\underset{Y_1, Y_2}{\text{Max}}\ EU_{II} = qW_1^{\alpha} + [1-q]W_2^{\alpha} \quad 0 < q < 1 \tag{2}$$

$$\text{subject to } Y_1 + Y_2 = 1 \tag{2.a}$$

$$y_1 = [1+r]Y_1 \tag{2.b}$$

$$y_2 = [1+r]Y_2 \tag{2.c}$$

$$W_1 = ay_1 + b[y_1 - x_1] \tag{2.d}$$

$$W_2 = ay_2 + b[y_2 - x_2] \tag{2.e}$$

q = Manager II's subjectively belief about the probability of State 1; W_i = payment to Manager II in State i.

By appropriate substitution of the constraints into the objective functions, the two managers' choice programs can be expressed as

$$\underset{X_1}{\text{Max}}\ EU_I = \{p[aX_1 + b[X_1 - Y_1]]c + [1-p][a[1-X_1] + b[Y_1 - X_1]]c\}[1+r]c \tag{3.a}$$

$$\underset{Y_1}{\text{Max}}\ EU_{II} = \{q[aY_1 + b[Y_1 - X_1]]c + [1-q][a[1-Y_1] + b[X_1 - Y_1]]c\}[1+r]c \tag{3.b}$$

The key feature about these choice problems is that each manager's decision is affected by the decision of the other manager through the reward function, which incorporates a relative performance affect.

Differentiating Equations (3.a) and (3.b) with respect to the appropriate choice variable, setting equal to zero, and simplifying yields the following first-order conditions

$$dEU_I/dX_1 = p[aX_1 + b[X_1 - Y_1]]^{c-1} - [1-p][a[1-X_1] + b[Y_1 - X_1]]^{c-1} = 0 \tag{4.a}$$

$$dEUII/dY1 = q[aY_1 + b[Y_1 - X_1]]^{c-1} - [1-q][a(1-Y_1] + b[X_1 - Y_1]]^{c-1} = 0 \tag{4.b}$$

These first-order conditions represent the two manager's investment decision rules. They can be interpreted as response functions that show how the decision of each manager depends on the decision of the other. This reflects the Cournot-Nash characterization of behavior and equilibrium.

Totally differentiating Equations (4.a) and (4.b) with respect to X_1 and Y_1 yields the slopes of the two response functions, which are given by

$$dX_1/dY_1|_{EU_I} = b/[a+b] > 0 \tag{5.a}$$

$$dY_1/dX_1|_{EU_{II}} = b/[a+b] > 0 \tag{5.b}$$

The response functions are symmetric and have a constant slope. They are shown in Figure 6.1, which provides a diagram analogue of the model. Their positive slopes reflect the existence of strategic complementarity (see Bulow et al., 1985) across the decision variables controlled by individual managers. A decision by either manager to increase the allocation

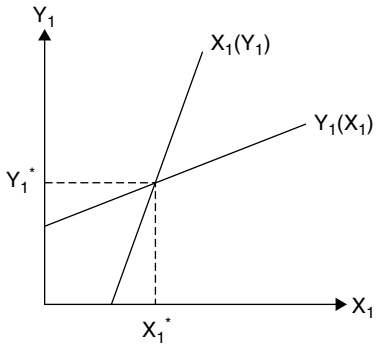

Figure 6.1 Response functions of managers I and II showing their investment choices as a function of the others

of resources to type 1 investments prompts the other manager to also increase his allocation to type 1 investments. The economic logic is the initial shift opens the other manager to relative under-performance if State 1 occurs. This is undesirable, so the second manager responds by also shifting his allocation to investments that payoff in State 1. The equilibrium choices of X_1 and Y_1 are determined by the intersection of the reaction functions; they are marked X_1^* and Y_1^* in Figure 6.1.

The mechanics of herd behavior can be illustrated using the model in a comparative statics exercise. Differentiating Equations (4.a) and (4.b) with respect to p and q and rearranging, yields

$$dX_1/dp|_{|Y_1} = -[Z_1^{c-1} + Z_2^{c-1}]/[c-1][pbZ_1^{c-2} + [1-p][a+b]Z_2^{c-2}] > 0 \quad (6.a)$$

$$dY_1/dq|_{|X_1} = -[W_1^{c-1} + W_2^{c-1}]/[c-1][qbW_1^{c-2} + [1-q][a+b]W_2^{c-2} > 0 \quad (6.b)$$

The signing of Equation (6.a) shows that increases in Manager I's subjectively held beliefs about the probability of State 1 shift up his own reaction function, which induces him to allocate more resources to investments that pay off in State 1 given Manager II's existing allocation. From Figure 6.1, it is then evident that this shift induces Manager II to act in a herd-like fashion by increasing his allocation of resources to State 1 production. From Equation (6.b), the same logic would apply to changes in Manager II's subjectively held beliefs about the probability of State 1.

The mechanism driving this pattern involves a feedback process. Initially, Manager I changes his allocation on the basis of his changed subjective beliefs. Manager II responds by changing his allocation so as not to risk exposure to a bad relative performance in State 2, and this then induces further second-order changes in Manager I's allocation. It is important to recognize that these changes in allocations have nothing to do with changes in "objective" information arising from learning about an objectively knowable world. There is also no asymmetry of information, though there is a difference in belief, reflected in the managers' different probability assignments. However, the changes in portfolio investment allocation result from purely "subjective" variation in the beliefs of Manager I. Manager II actually has unchanged beliefs, yet he still has an incentive to change his allocation and move with the herd. Finally, since the model is symmetric, the same arguments clearly apply to changes in Manager II's beliefs.

The exact effects of changes in beliefs on the pattern of allocation can be obtained by solving the total differential of the first-order conditions given by Equations (3.a) and (3.b). From these equations it can be shown that the size of the response (or herd effect) depends on two important conditions. A first necessary condition for herd behavior is risk aversion, which implies that $c < 1$. When c equals unity (risk neutrality) managers' investment decisions are independent of each other's beliefs and managers just maximize expected return. A second necessary condition is that $b > 0$, and if $b = 0$ there is no herding effect. These two conditions interact to cause herd behavior. Risk aversion determines whether a manager cares about the fact that the reward function is based on relative performance. The parameter b determines the extent of impact of relative performance on rewards.[3] Note, if the size of the performance penalty accelerates with the magnitude of relative difference in performance, this increases the incentive of risk-averse managers to herd.

The above model embodies a Cournot-Nash equilibrium concept. As is well known, this equilibrium concept can be generalized to an N agent context. In the current model, such a generalization can be achieved by respecifying the managerial reward functions to depend on the average allocation of all managers. In this case the solution to the model would be characterized by N first-order conditions similar to Equations (3.a) and (3.b) plus an equation determining the average allocation. However, a problem with this interpretation is that as N increases, each manager exercises less weight on the average allocation, making it harder for an individual manager to move the herd.

An alternative construction is one in which managers are arrayed in a circle and each manager's reward function is tied to the behavior of the manager to his right. This can be termed a proximity relative reward effect. In this case there would be N first-order conditions that are identical in form to the current model. Indeed, the current model represents a circle with two participants. The economic logic of the circle is that changes in investment decisions of any individual manager cause the neighboring manager to the left to change his decision, thereby setting off a ripple effect that runs through the entire circle and continues until the initial impulse has been dissipated through appropriate portfolio adjustments.

6.2 Conclusion

This chapter has provided a simple formalization of herd behavior based on the "safety in numbers" principle that captures popular explanations of herding. The key assumptions were that managers were risk averse and their remuneration was at least partly based on relative performance. *Prima facie*, these assumptions seem quite reasonable. As noted at the outset of the chapter, there are other explanations of herd behavior. These include explanation in terms of network externalities in production (Katz and Shapiro, 1985), and explanation in terms of optimal information processing (Scharfstein and Stein, 1990; Banerjee, 1992). These latter explanations are narrowly economic in character. The current explanation can be viewed as socio-economic and institutional in character, given its reliance on managerial utility functions and the structure of the managerial reward system. This is an attractive characteristic that links the theory of managerial behavior with the theory of household or individual behavior. Thus, managerial behavior can also partake of bandwagon effects (Leibenstein, 1950) via which the decisions of individual managers are influenced by the group. Interestingly, not only may this situation characterize household and managerial behavior, but it may also characterize research in economics. Finally, not only is herd behavior an interesting microeconomic behavior, it becomes an important mechanism for providing microfoundations to Minsky's (1982, 1993) financial instability hypothesis, which is examined in Chapter 8.

7
Short-termism: The Problem of Managerial Turnover

In his now famous testimony before the House Committee on Oversight and Government Reform on October 23, 2008, former Federal Reserve Chairman Alan Greenspan stunned observers by declaring:

> As I wrote last March, those of us who have looked to the self-interest of lending institutions to protect shareholders equity, myself especially, are in a state of shocked disbelief (p.11)

In response to questions from Committee Chairman Waxman, Mr. Greenspan elaborated further on this failure of self-interest:

> I made a mistake in presuming that the self-interest of organizations, especially banks and others, were such that they were best capable of protecting their own shareholders and their equity in firms … So the problem here is something which looked to be a very solid edifice, and, indeed, a critical pillar to market competition and free markets did break down. And I think that, as I said, shocked me. … I found a flaw in the model that I perceived is the critical functioning structure that defines how the world works, so to speak. (pp.12–13)

Chairman Greenspan's testimony showed how his long-held beliefs about the efficiency of financial markets rested critically on the assumption that financial firms act in self-interested fashion, by which is meant pursuit of profit maximization. His testimony also showed how he had failed to appreciate how financialization fundamentally undermined profit maximization by undermining the alignment of interest between managers and shareholders.

This chapter is based on "Managerial turnover and the theory of short-termism," *Journal of Economic Behavior & Organization*, 32 (1997): 547–57.

Profit maximization is essential to the efficient functioning of market economies. First, it ensures business produces efficiently in the sense of incurring the minimum cost necessary to produce the chosen level of output. Second, it ensures business chooses the most profitable level of output and does not over- or under-produce. However, firms are run by managers, giving rise to separation of ownership from control. That separation creates a potential conflict of interest between owners (principals) and managers (agents) which can lead to economically inefficient outcomes if managers pursue their interests.

Despite this fundamental problem being well understood, Chairman Greenspan was blind to the problem and the fact that financialization had profoundly worsened it by introducing a new business model. At the base of the new model was a system of flawed incentives whereby brokers and bankers were paid via commissions and bonuses from profits. That system created an incentive to "push loans" rather than engage in "sound lending" because every transaction increased brokers' and bankers' commission incomes.

This new system was intimately connected to financial innovation associated with the introduction of mortgage-backed securities (MBS), collateralized debt obligations (CDOs), and the so-called "shadow" banking system that provided banking services largely outside of the system of financial regulation. Traditionally, banks made loans and mortgages and held on to them until they were repaid, giving banks an incentive to engage in sound lending as they bore the costs of default. The emergence of MBS and CDOs changed that. Instead of holding on to mortgages and loans, banks made loans and then sold them for bundling in MBS and CDOs, a process that became known as the "originate to distribute" model. The critical feature is that profits are booked when the loan is sold, thereby setting up an incentive for brokers and bankers to make as many loans as possible and thereby maximize commissions and profits. If loans subsequently sour, they are long gone from the books, having been bundled and sold to investors as part of an MBS.

This incentive to loan push infected the whole chain of dealing, beginning with real estate brokers, through mortgage brokers, insurance brokers, assessors, ratings agencies and bankers. The "originate to distribute" business model therefore removed a critical market discipline. Borrowers are frequently overly optimistic and willing to extend themselves (especially in real estate), because they can declare bankruptcy. That places the onus on lenders to impose market discipline by making sound loans. The "originate to distribute" model fundamentally undercut that discipline by giving agents on the lending side an

incentive to complete deals so as to collect commissions, fees, and bonuses.

Moreover, not only did the new business model encourage loan pushing, but it also encouraged financial firms to take on excessive balance sheet risk that made them financially fragile. That is because managers profited from the extra risk but viewed themselves as bearing little of the cost. One source of risk was increased leverage in the form of a higher debt–equity ratio. Equity capital is the most expensive form of capital, while return on equity (that is, profits relative to equity) is a standard metric of bank performance. Managers therefore had a triple incentive to rely on debt funding: to lower costs and increase profitability; to improve their metric of performance; and to enable them to finance additional business. However, leverage creates financial fragility and made banks vulnerable to insolvency as small declines in asset prices quickly wiped out their small tier of equity finance.

A second source of risk was maturity mismatch of financing. Banking always involves a maturity mismatch in that banks take deposits that can be withdrawn on demand but they use deposits to finance longer-term loans. This potentially exposes banks to sudden withdrawals by depositors that they are unable to meet. Since short-term finance is usually cheaper than long-term finance, managers had an incentive to over-rely on the former in order to raise profits and their bonuses. That introduced another form of fragility, as financial firms were unable to roll over and renew their short-term financing once asset prices started falling and confidence collapsed.

In sum, financialization created a new business model in the financial sector that radically widened the divide between the interests of shareholders and managers. That division encouraged managers to loan push, take on excessive leverage, and use excessive short-term finance. These practices increased returns to managers since they received commission income and a share of current profits but bore little of the subsequent default costs. Chairman Greenspan's ideological belief in the efficiency of markets blinded him to how financialization dangerously worsened these management incentive problems.

7.1 The theory of short-termism

The separation of ownership from control constitutes a generic problem in corporate governance. Financialization can be thought of as creating specific manifestations of that problem. One manifestation is herd

behavior, which was discussed in Chapter 6. A second manifestation is short-termism by managers.

The theory of short-termism explains why firms are concerned about the time pattern of returns and why firms have a preference for projects where payoffs come sooner rather than later. Such behavior is inconsistent with standard theory, which claims that firms maximize their net present value and that the time pattern of returns from different projects is only relevant to the extent that it affects net present values.

There is an extensive literature on the theory of short-termism that explains it as the product of either financial market imperfections or managers' career concerns. Interestingly, like Chairman Greenspan, that literature has tended to treat the problem rather benignly. Stein (1989) argues that managerial short-termism represents a rational response on the part of managers who have long-term horizons but believe that the market attaches weight to the current stock price. In this case, if managerial rewards are linked to current stock prices and managers have no way of conveying to shareholders the benefit of a long-term strategy, then managers may adopt a short-term strategy to maximize their rewards. In a similar spirit, Shleifer and Vishny (1990) argue that the presence of noise traders may introduce a bias against long-term projects by imposing a higher discount rate on these projects. Lastly, Webb (1993) presents a model of managerial short-termism that rests on asymmetric information regarding the quality of firms' earnings streams. In a multi-period economy, projects are started if they have positive net present value and terminated if their net present value becomes negative. If the terms on which projects are financed can be renegotiated as additional information becomes publicly available, firms may choose projects which are less productive in net present value terms but yield early information that enables favorable renegotiation of the terms of finance. In all of these instances, managerial short-termism is a constructive second-best response to an underlying market imperfection.[1]

With regard to the managerial career literature, Narayanan (1985) emphasizes how managers may undertake short-term projects that have a rapid return in order to build-up their reputations on which their earnings are based. Holmstrom and Ricart i Costa (1986) advance a similar model in which earnings are related to a manager's "talent" and superiors learn about talent through observing project returns. In this literature, managerial short-termism is a way that superior managers signal their superior ability.

Palley (1997b) presents an alternative theory of short-termism that rests on the presence of managerial turnover, and the paper shows the

significance of managerial turnover for managers' choices. This theory is less benign in its explanation of short-termism, and provides a theoretical explanation for the type of lending and investment decisions that have characterized financialization and were revealed in the financial crash of 2008.

7.2 A model of short-termism based on managerial turnover

The key assumptions of the managerial turnover model of short-termism are that (i) there is job turnover amongst firms' managers with each manager having a positive probability of quitting and moving to another firm, and (ii) managers' rewards are tied to the current profitability of the firm they are working for. Given this, rational own reward maximizing managers may choose projects that have intrinsically lower net present values but yield higher returns in the earlier part of the project's life. This is because following a short-term strategy locks in immediate rewards, whereas a long-term strategy sets up rewards that managers may not be around to enjoy.

The formal assumptions of the model are as follows:

(i) Each manager is confronted by two alternative projects each requiring \$1.
(ii) Projects are divisible and run for three periods.
(iii) Managers are subject to a resource constraint of \$1.
(iv) Project returns are *ex-ante* private information known only to managers.
(v) Managers and firms share a common discount rate.
(vi) Managers' rewards are based on current cash flows.
(vii) There is an exogenously given probability, $0 < q < 1$, that a manager will quit voluntarily at the end of any period.

The assumption of perfect project divisibility means that managers can choose to finance one project in its entirety or they can choose to form a portfolio of projects. The assumption of private information means shareholders cannot force managers to choose the project with the highest net present value, which is equivalent to saying that shareholders cannot exercise the managerial function and act as if they were the management. The assumption of a common discount rate means that managers are not subject to any myopia that leads them to systematically prefer projects with a short-term bias. Lastly, quits are voluntary

Table 7.1 The time sequence of project returns

	Returns		
Project	t = 0	t = 1	t = 2
A	$R_{A,0}$-1	$R_{A,1}$	$R_{A,2}$
B	$R_{B,0}$-1	$R_{B,1}$	$R_{B,2}$

and managers are assumed to leave for jobs that yield unambiguously superior utility outcomes to their current employment.

The projects returns are described in the Table 7.1, and the associated net present values of the projects are given by

$$NPV_A = R_{A,0} - 1 + DR_{A,1} + D^2R_{A,2} \tag{1.a}$$

$$NPV_B = R_{B,0} - 1 + DR_{B,1} + D^2R_{B,2} \tag{1.b}$$

$D =$ discount factor and $D < 1$. It is assumed that project A has a higher net present value so that $NPV_A > NPV_B$. However, project B has superior early cash flows so that $R_{B,0} > R_{A,0}$ and $R_{B,1} > R_{A,1}$. This structure captures the potential conflict between net present value and the timing pattern of returns.

To begin with, consider the case of risk-neutral managers, in which case managers' utility functions are linear in income and they therefore seek to maximize their own expected personal income. Such managers always fully fund the project that yields them the highest return. This is because they don't care about income variability and therefore have no interest in diversifying their project portfolios. However, though the project returns are certain, risk is still present for individual managers because of the uncertainty regarding quits. The analysis below shows that there exists a critical probability of quitting at which such managers exclusively fund the short-term project. The importance of this result is that it shows that short-termism can result purely from the existence of managerial turnover and need have nothing to do with managerial risk aversion.

Given the above description of project cash flows, the program facing an expected income maximizing manager is given as follows

$$\underset{s_A, s_{AB}}{\text{Max}}\ U = y_0 + pDy_1 + p^2D^2y_2 \tag{2}$$

$$\text{subject to } y_0 = a[s_A R_{A,0} + s_B R_{B,0}] \quad 0 < a < 1 \tag{2.a}$$

$$y_1 = a[s_A R_{A,1} + s_B R_{B,1}] \tag{2.b}$$

$$y2 = a[s_A R_{A,2} + s_B R_{B,2}] \tag{2.c}$$

$$s_A + s_B = 1 \quad s_A, s_B > 0 \tag{2.d}$$

$$p = 1 - q \quad 0 < q < 1 \tag{2.e}$$

y_t = manager's income in period t (t = 0,1,2), a = share of revenues paid to managers, s_j = share of resources invested in project j (j = A,B), and p = probability that a manager will remain with the firm.

Equation (2) is the manager's objective function. Equations (2.a)–(2.c) determine the manager's rewards as a function of his project investment decisions. Equation (2.d) is the resource constraint, and Equation (2.e) relates the probability that a manager will remain with the firm to the probability he will quit.

Proposition 7.1 *If the probability of quitting is zero (q = 0), then a risk-neutral manager will always choose to fully fund the project with the highest net present value.*

Proof: If q = 0 then p = 1. Substituting (2.a)–(2.d) into (2) and using the definitions of the project's net present value given by (1.a) and (1.b) yields

$$\underset{s_A}{\text{Max}}\ U = a\{s_A NPV_A + [1 - s_A]NPV_B\} \text{ subject to } 0 < s_A < 1.$$

Given $NPV_A > NPV_B$, this expression is maximized by setting $s_A = 1$.

The significance of this result is that it shows, in the absence of quits, risk-neutral managers who share a common discount factor with the firm, and who receive part of the firm's cash flows, will maximize net present values as predicted by conventional theory.

Proposition 7.2 *If the probability of quitting is unity (q = 1), then risk-neutral managers will always choose to fully fund the project with the higher early cash flows.*

Proof: Setting p = 0, and substituting (2.a) and (2.d) into (2) yields

$$\underset{s_A}{\text{Max}}\ U = as_A R_{A,0} + a[1 - s_A]R_{B,0} \text{ subject to } 0 < s_A < 1.$$

Given $R_{B,0} > R_{A,0}$, this expression is maximized by setting $s_A = 0$.

Though for the special case of $p = 0$, the significance of this result is that it illuminates the importance of quit behavior linked with the system of managerial rewards, for determining project selection.

Proposition 7.3 *There exists a critical probability of quitting, $q = q^*$, below which risk-neutral managers fully fund the project with the higher net present value (project A), and above which they fully fund the project with superior early cash flows (project B). At $q = q^*$, managers are indifferent between the two projects.*

Proof: For the general case when $0 < p < 1$, substitution of (2.a)–(2.d) into (2) yields

$$\underset{s_A}{\text{Max}}\ V = as_A\{[R_{A,0} + pDR_{A,1} + p^2D^2R_{A,2}] - [R_{B,0} + pDR_{B,1} + p^2D^2R_{B,2}]\}$$
$$+ a[R_{B,0} + pDR_{B,1} + p^2D^2R_{B,2}]$$

The choice variable is s_A and only the expression in the curly parentheses is relevant to that choice. Now define two variables, Z_A and Z_B, given by

$$Z_A = R_{A,0} + pDR_{A,1} + p^2D^2R_{A,2}$$
$$Z_B = R_{B,0} + pDR_{B,1} + p^2D^2R_{B,2}$$

Inspection of the term within the curly parentheses shows that if $Z_A > Z_B$, achieving a constrained maximum requires setting $s_A = 1$. Similarly, if $Z_A < Z_B$, achieving a constrained maximum requires setting $s_A = 0$. Twice differentiating Z_A and Z_B with respect to p yields

$$dZ_A/dp = DR_{A,1} + 2pD^2R_{A,2} > 0; d^2Z_A/dp^2 = 2D^2R_{A,2} > 0$$
$$dZ_B/dp = DR_{B,1} + 2pD^2R_{B,2} > 0 : d^2Z_B/dp^2 = 2D^2R_{B,2} > 0$$

The functions Z_A and Z_B are therefore both continuous and monotonic in p, and both are positively sloped and the slope is increasing. Lastly, for a value of $p = 0$, $Z_A = R_{A,0}$ and $Z_B = R_{B,0}$ so that $Z_A < Z_B$. Similarly, for a value of $p = 1$, $Z_A = NPV_A$ and $Z_B = NPV_B$ so that $Z_A > Z_B$. Given the continuous and monotonic nature of the functions Z_A and Z_B, and combining this with the fact that there exists values of p within the interval [0, 1] for which $Z_A < Z_B$ and $Z_A > Z_B$, there then exists a unique value of $p = p^*$ where $0 < p^* < 1$, at which $Z_A = Z_B$. Given the above decision criterion, managers will be indifferent between projects A and

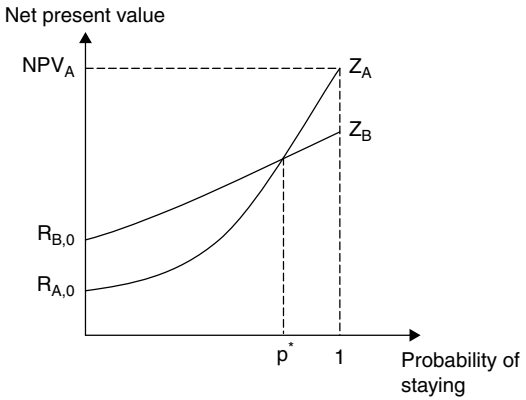

Figure 7.1 Determination of the critical quit probability at which risk-neutral managers become short-termist

B at $p = p^*$, will fully fund project B if $p < p^*$, and will fully fund project A if $p > p^*$. The value of q at this critical value is given by $q^* = 1 - p^*$.

The determination of p^* is shown in Figure 7.1, which plots Z_A and Z_B as functions of p. For $p = 0$, $Z_A = R_{A,0}$ and $Z_B = R_{B,0}$. For $p = 1$, $Z_A = NPV_A$ and $Z_B = NPV_B$. The value of p^* is determined by the intersection of the Z_A and Z_B functions. This figure serves to illustrate how the choice of projects is affected by the probability of managers leaving the firm. Managers with a high probability of quitting (low p) will adopt a short-term perspective, while managers with a low probability of quitting (high p) will maximize net present value in accordance with conventional theory.

The assumption of risk neutrality helps render transparent the significance of managerial turnover, as represented by the probability of quitting, for the theory of short-termism. However, the model can be expanded to include risk aversion on the part of managers. This serves to reduce the incidence of short-termism because managers now have an incentive to hedge the possibility that a quit opportunity will not materialize. They therefore undertake some of the long-term project to diversify against this risk, and the share of the long-term project rises as the probability of quitting falls.

For the risk-averse case, the representative manager's objective function given by Equation (2) is modified as follows

$$\underset{s_A, s_B}{\text{Max}}\ U = U(y_0) + pDU(y_1) + p^2D^2U(y_2) \quad U' > 0, U'' < 0 \qquad (2')$$

Substituting Equations (2.a)–(2.d) into (2′) yields

$$\underset{s_A}{\text{Max}}\ U = U(as_A R_{A,0} + a[1 - s_A]R_{B,0}) + pDU(as_A R_{A,1} + a[1 - s_A]R_{B,1}) + p^2D^2U(as_A R_{A,2} + a[1 - s_A]R_{B,2}) \quad (3)$$

$$\text{subject to } s_A < 1 \quad (3.a)$$

$$s_A > 0 \quad (3.b)$$

Differentiating the above Kuhn-Tucker program with respect to s_A yields the following Kuhn-Tucker conditions

$$dU/ds_A = U_{y0}a[R_{A,0} - R_{B,0}] + pDU_{y1}a[R_{A,1} - R_{AB,1}] + p^2D^2U_{y2}a[R_{A,2} - R_{B,2}] + L_1 - L_2 > 0 \quad (4.a)$$

$$s_A dU/ds_A = 0 \quad (4.b)$$

$$dU/dL_1 = 1 - s_A > 0 \quad (4.c)$$

$$L_1 dU/dL_1 = 0 \quad (4.d)$$

$$dU/dL_2 = s_A > 0 \quad (4.e)$$

$$L_2 dU/dL_2 = 0 \quad (4.f)$$

Proposition 7.4 *Risk-averse managers invest in both types of project so that the solution to the above program has both Kuhn-Tucker multipliers equal to zero and* $0 < s_A < 1$.

Proof: The proof is by contradiction. If $s_A = 1$, then per (4.b) $dU/ds_A = 0$. Per (4.c) and (4.d), $L_1 > 0$ and per (4.e) and (4.f) $L_2 = 0$. However, if $s_A = 1$, inspection of Equation (3) shows the terms $R_{B,0}$, $R_{B,1}$, and $R_{B,2}$ disappear from Condition (4.a). This means that (4.a) is positive, which implies $dU/ds_A > 0$ which violates (4.b).

If $s_A = 0$, then per (4.b) $dU/ds_A > 0$. Per (4.c) and (4.d), $L_1 = 0$, and per (4.e) and (4.f) $L_2 > 0$. However, if $s_A = 0$, inspection of Equation (3) shows the terms $R_{A,0}$, $R_{A,1}$, and $R_{A,2}$ disappear from Condition (4.a). This means that (4.a) is negative, which implies $dU/ds_A < 0$ which violates (4.b).

The above proof means that risk-averse managers partially fund both the high net present value project and the project with superior early cash flows. The economic logic is that risk-averse managers form portfolios of projects as a means of insuring their own rewards. Risk aversion therefore

provides an independent additional reason for short-term managerial behavior.

Though risk aversion explains why managers invest in both projects, the degree of manager short-termism is still affected by the likelihood that a manager will quit. Consequently, the effect of quits in the presence of risk-averse managerial behavior is qualitatively the same as under risk-neutral behavior.

Proposition 7.5 *The share of resources that risk-averse managers allocate to the long-term project with higher net present value increases as the probability of quitting declines.*

Proof: Given $0 < s_A < 1$ by proposition 4, this means that Condition (4.a) holds with equality so that

$$dU/ds_A = U_{y0}a[R_{A,0} - R_{B,0}] + pDU_{y1}a[R_{A,1} - R_{B,1}] + p^2D^2U_{y2}a[R_{A,2} - R_{B,2}] = 0 \quad (5)$$

Differentiating (5) with respect to s_A and p yields

$$ds_A/dp = -\{DU_{y1}a[R_{A,1} - R_{B,1}] + 2pD^2U_{y2}a[R_{A,2} - R_{B,2}]\}/ \quad (6)$$
$$a^2\{U''_{y0}[R_{A,0} - R_{B,0}]^2 + pDU''_{y1}[R_{A,1} - R_{B,1}]^2 + p^2D^2U''_{y2}[R_{A,2} - R_{B,2}]^2\}$$

The denominator is unambiguously negative owing to the assumption of diminishing marginal utility of income. The numerator can also be shown to be unambiguously negative as a result of the first-order condition. This condition states that

$$U_{y0}a[R_{A,0} - R_{B,0}] + pDU_{y1}a[R_{A,1} - R_{B,1}] + p^2D^2U_{y2}a[R_{A,2} - R_{B,2}] = 0$$

The first two terms are negative and the third positive. This implies $pDU_{y1}a[R_{A,1} - R_{B,1}] + p^2D^2U_{y2}a[R_{A,2} - R_{B,2}] > 0$ so that $DU_{y1}a[R_{A,1} - R_{B,1}] + 2pD^2U_{y2}a[R_{A,2} - R_{B,2}] > 0$. Thus, $-\{DU_{y1}a[R_{A,1} - R_{B,1}] + 2pD^2U_{y2}a[R_{A,2} - R_{B,2}]\} < 0$.

In sum, risk-averse managers have two reasons for exhibiting short-termism. The first reason is their risk aversion, which provides an incentive to form portfolios of projects so as to spread their own-reward risk. The second concerns the degree of their tenure as measured by the probability of quitting. As this probability declines they invest proportionately more in the long-term higher net present value project.

Comparing the behavior of risk-neutral and risk-averse managers reveals that risk-averse mangers can display both "more" and "less"

short-termism. When $p < p^*$, risk-neutral managers are fully invested in the project B (the short-term project) while risk-averse managers are not. That is because the risk-averse managers invest some part of the resources they control in the long-term project for portfolio diversification reasons. Thus, risk-averse managers display less short-termism. However, if $p > p^*$, risk-neutral managers are fully invested in the project A (the long-term project) while risk-averse managers are not. In this instance, risk-averse managers display more short-termism.

7.3 Some further considerations

The above model illuminates how the extent of short-termism depends importantly on the likelihood of managerial quits, which reveals the economic significance of managerial turnover. A direct implication is that economies characterized by a high level of managerial turnover will tend to exhibit a greater degree of short-termism.

Financialization, with its pattern of managerial remuneration based on commissions and profit bonuses, can be thought of as establishing a structure equivalent to high turnover. That is because managers received benefits up front but bore none of the back-loaded costs, as if they had quit before the costs came due.

In the above analysis the probability of quits was taken as an exogenous institutional datum. However, in practice it is likely to be affected by a number of influences, some of which are endogenous. These influences include (a) exogenous cultural and social forces regarding attitudes toward corporate loyalty and job mobility; (b) endogenous actions of managers intended to increase the probability of receiving an outside job offer; and (c) endogenous decisions of firms regarding the provision of incentives designed to get managers to adopt a long-term perspective.

The above explanation of managerial short-termism also suggests that there may be a trade-off between the efficiency benefits of managerial mobility and the extent of short-termism. Managerial mobility yields productivity benefits by placing the best managers in the most productive locations. However, it also promotes quits and short-termism, which lowers productivity by inducing managers to select lower net present value projects.

Managers may also endogenously influence the probability of quits. For instance, suppose potential hiring firms only observe managers' current performance and make job offers on the basis of this performance. In this case, managers will have a further incentive to engage in short-termism as a means of inducing improved outside job offers.

This channel of effect can be modeled by specifically introducing the income associated with outside job offers, and making both the income and the probability of outside job offers positive functions of current performance.

A simplified representation of this situation, involving a risk-neutral manager, can be captured by respecifying the program given by Equations (2)–(2.e) as follows:

$$\underset{s_A, s_B}{\text{Max}}\ U = y_0 + p(s_A R_{A,0} + s_B R_{B,0}) D y_1 \tag{7}$$
$$+ p(s_A R_{A,0} + s_B R_{B,0}) p(s_A R_{A,1} + s_B R_{B,1}) D^2 y_2$$
$$+ [1 - p(s_A R_{A,0} + s_B R_{B,0})] V_0 (s_A R_{A,0} + s_B R_{B,0})$$
$$+ p(s_A R_{A,0} + s_B R_{B,0}) [1 - p(s_A R_{A,1} + s_B R_{AB,1})] V_1 (s_A R_{A,1} + s_B R_{AB,1})$$

subject to

$$y_0 = a s_A R_{A,0} + a s_B R_{B,0} \quad 0 < a < 1 \tag{7.a}$$

$$y_1 = a s_A R_{A,1} + a s_B R_{B,1} \tag{7.b}$$

$$y_2 = a s_A R_{A,2} + a s_B R_{B,2} \tag{7.c}$$

$$s_A + s_B = 1 \qquad s_A, s_B > 0 \tag{7.d}$$

$$p' < 0, V_0' > 0, V_1' > 0$$

V_0 = discounted value of the income stream associated with job offers received at the end of period 0, V_1 = discounted value of the income stream associated with job offers received at the end of period 1. Moreover, the value of job offers is assumed to be such that $V_0 > Dy_1 + D^2 y_2$ and $V_1 > D^2 y_2$, which ensures that outside offers are superior to remaining with the firm.

The first-order conditions are now more complicated. However, inspection of the program given by (7)–(7.d) is sufficient to reveal that managers have an added incentive for short-term behavior because such behavior raises the probability and value of outside offers received at the ends of periods 0 and 1. Managers therefore internalize the effect of s_A on both the probability and value of an outside offer, and their investment choices today are in part chosen to generate future outside opportunities for themselves. However, balancing this, risk-averse managers also realize that if these opportunities do not materialize they risk being stuck with their current firm and the outcomes that their past choices have determined. Short-term behavior therefore raises the probability of receiving an attractive offer in the near future. However, it lowers the probability

of receiving an attractive offer in the distant future, by which time the consequences of adopting projects with lower net present values will have become visible.

The above considerations raise associated issues of optimal contract design. The incentive for managers to adopt a short-term perspective means there is a principal–agent problem. Owners therefore have a countervailing incentive to induce managers to overcome the truncation in their time horizon caused by the possibility of quitting. One possible response is to give managers rising lifetime salary profiles. In terms of the model, this involves reconstructing the managerial payoff functions given by (2.a), (2.b), and (2.c) so that the revenue share parameter "a" rises with employment duration such that $a_0 < a_1 < a_2$, where the subscript denotes time period.

A second response is to give managers stock options, the goal being to give managers an ownership share and thereby align the manager's objective function with that of shareholders. However, managers who quit will have an incentive to sell their stock when they leave. This is because they have inside information and know that project returns are temporarily high owing to the prior short-term nature of project selection. The stock market (shareholders) does not know this owing to the information asymmetry, and will instead value the company highly on the basis of high reported current profits. Thus, if an option scheme is to be successful, the options must only be exercisable at some future distant date after they have been granted. In terms of the model, such a scheme amounts to entitling managers to a share of period 2 revenues, whether or not they stay. This provides an incentive to adopt a long-term perspective when the project mix is selected in period 0.

This last solution has been widely mooted in the wake of the financial crisis of 2008. As regards the "originate to distribute" financial sector business model, the solution is to get lenders to retain a significant stub of the original loan on which they bear default risk. That risk would then provide lending firms an incentive to engage in sound lending rather than loan pushing, and Chairman Greenspan recommended such a reform in his same October 23, 2008 Congressional testimony in which he admitted having found a flaw in his thinking:

> As much as I would have preferred otherwise, in this financial environment I see no choice but to require that all securitizers retain a meaningful part of the securities they issue. This will offset, in part, market deficiencies stemming from the failures of counterparty surveillance. (p.11)

8

A Theory of Minsky Super-cycles and Financial Crises

Chapter 4 emphasized the relevance of the ideas of Hyman Minsky for understanding business cycles. However, Minsky's ideas, as developed in his financial instability hypothesis, extend beyond standard cycle analysis and provide an encompassing frame for understanding financialization, albeit one that emphasizes instability. Chapters 2 and 3 focused on the income redistribution aspects of financialization and the role of financial markets, especially credit, in filling resulting demand shortages. Minsky's theory adds a rich evolutionary dynamic that explains why financialization has a tendency to instability. That tendency is supported by the microeconomics of managerial herd behavior and short-termism, which were examined in Chapters 6 and 7.

The chapter explores and extends Minsky's (1959a, 1959b, 1982, 1992) work, by surfacing ideas and themes that are clearly present in his work but have not been given enough attention by economists, including those (almost exclusively Post Keynesians) who have recognized his contribution. While there have been many attempts to formalize Minsky's work, those attempts tend to treat him as a narrow theorist of financial business cycles rather than a process theorist of financial capitalism.

The chapter argues that Minsky needs to be understood not only through a conventional medium-term business cycle lens as developed in Chapter 4, but also through the lens of long-term swings. The medium-term cycle is labeled the "basic cycle" and it operates through Minsky's

This chapter was originally presented at a conference titled 'The Political Economy of Central Banking' funded by the Social Sciences and Humanities Research Council (SSHRC) of Canada held at Ryerson University, Toronto, Ontario, Canada, May 28–29, 2009. It was subsequently published as "A theory of Minsky super-cycles and financial crises," *Contributions to Political Economy*, 30 (1) (2011): 31–46.

stages of finance schema: hedge – speculative – Ponzi. The long swing dynamic is labeled the "super-cycle".

The reason for introducing this distinction is to capture the financial instability effects arising from the ongoing process of institutional, product, and behavioral change. Though Minsky undoubtedly emphasized the basic cycle, reading between the lines it is possible to detect a super-cycle perspective, and the notion of a super-cycle is readily incorporated into his argument.

Such an interpretation expands and enriches Minsky's financial instability hypothesis, which can now be interpreted as a generalized financial cycle theory. This generalized theory weaves together a medium-term Keynesian-styled dynamic resting on the Samuelson (1939)–Hicks (1950) multiplier-accelerator mechanism with long-cycle thinking in the tradition of economists such as Schumpeter (1939) and Kondratiev.

Whereas considerable attention has been devoted to the basic cycle dimension of Minsky's thinking, less attention has been devoted to the long-swing super-cycle dimension. Part of the reason for this is Minsky's own lack of clarity and failure to distinguish between the basic cycle and the super-cycle. It is the super-cycle that ultimately permits financial crisis. Whereas financially driven business cycles occur every decade, financial crises occur over longer durations, reflecting the longer phase of the super-cycle.[1] By failing to distinguish these two dynamics, Minsky's writings give the impression that deep financial crises are more common than they are.

8.1 Minsky as process theorist

The foundation of Minsky's thinking is his construction of the economic process. That makes Minsky a theorist of capitalism who theorized it in terms of "process". This approach to economics put him at odds with modern economics that constructs capitalism in terms of "equilibrium", and it helps explain why Minsky was overlooked by much of the economics profession.

The equilibrium approach looks at the economic problem as one of establishing efficient market allocations. To the extent that dynamics enter, it is with regard to whether those equilibrium allocations are stable or unstable. Viewed from the equilibrium perspective, process issues (that is, dynamics) take a back seat and are an add-on to the economic problem.

For Minsky, process is the issue, and his theory of process can be summarized as: "Success breeds excess breeds failure." Such a construction of

the economic process is one of evolutionary instability. Evolutionary factors are present because the economy evolves through stages that breed successive stages. Instability is present because the system periodically ends in failure and collapse, which is why Minsky termed his approach the financial instability hypothesis.

Minsky's construction of the capitalist economic process recognizes features that are both general and historically specific. The generality of the "success breeds excess breeds failure" process is captured in Minsky's view that "The more things change, the more they remain the same (Minsky, 1993, p. 2)." The historical specificity is captured by his accompanying view "One can never step in the same river twice (Minsky, 1993, p. 2)."

The financial crisis of 2008 fits the schema. Its specific details are different from past financial crises, but its underlying logic and evolution are structurally similar; financial capitalism is governed by a general process that is enduring, but the landscape through which the process travels is forever changing and therefore historically specific.

8.2 Minsky as cycle theorist

Minsky's financial instability hypothesis can be thought of as resting on two different cyclical processes, as illustrated in Figure 8.1. The first process is labeled the "Minsky basic cycle," while the second process is labeled the "Minsky super-cycle." The basic cycle is widely recognized and rests on the evolution of financing arrangements through successive stages of hedge, speculative, and Ponzi finance. The super-cycle is less well recognized, though it is fully articulated in a paper co-authored by Piero Ferri (Ferri and Minsky, 1992) that deserves far greater recognition. Unfortunately, the critical arguments in that paper were omitted in Minsky's (1992) brief article titled "The Financial Instability Hypothesis," in which he summarized his theory.

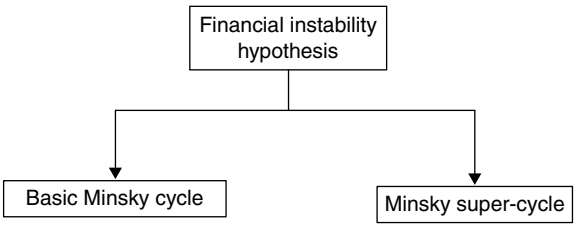

Figure 8.1 The two cycles embedded in the financial instability hypothesis

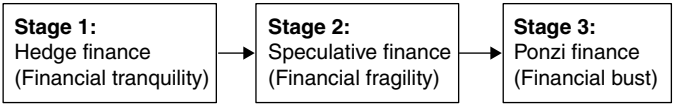

Figure 8.2 Stages of the Minsky basic cycle

The basic cycle captures the phenomenon of emerging financial fragility as reflected in agents' balance sheets and financing arrangements.[2] The basic cycle is illustrated in Figure 8.2 and it involves the familiar process of evolution, beginning with hedge finance, passing through speculative finance, and ending with Ponzi finance. The basic cycle operates at the level of the individual enterprise.

Much has been written on the basic cycle and Minsky (1992) carefully defined its stages. "Hedge finance units are those which can fulfill all of their contractual payment obligations by their cash flows (Minsky, 1992, p. 7)," and it tends to be associated with greater weight of equity financing in the liability structure. "Speculative finance units are units that can meet their payment commitments on 'income account' on their liabilities, even as they cannot repay the principle out of cash flows. Such units need to 'roll over' their liabilities (Minsky, 1992, p. 7)." Lastly, "for Ponzi units, the cash flows from operations are not sufficient to fulfill either the repayment of principle or the interest due on outstanding debts by their cash flows from operations. Such units can sell assets or borrow (Minsky, 1992, p. 7)."

As discussed in Chapter 4, there are many formal models in the spirit of the Minsky basic cycle. These include (to list a few) Foley (1987), Semmler and Franke (1991), Gallegati and Gardini (1991), Skott (1994), and Delli Gatti et al. (1994). All of these models emphasize the emergence of gradually more fragile corporate balance sheets that are marked by either reduced liquidity or higher debt–equity ratios. These developments give rise to balance sheet congestion that eventually strangles investment activity. This triggers an economic downturn that generates a deleveraging process, which eventually creates the conditions for another upswing. Palley (1994, 1997a) presents a model that focuses on households and consumer debt, and in that model it is the growing burden of debt service payments from free-spending debtor households to thriftier creditor households that eventually curtails the expansion.

Minsky's theory of the basic cycle involves important psychological influences. The move between financing stages is in part driven by agents becoming progressively more optimistic. That optimism manifests itself

in increasingly optimistic valuations of assets and assessments of revenue streams, combined with increased willingness to take on more risk in the belief that good times are here forever. This optimistic psychology afflicts both borrowers and lenders, and not just one side of the market. That is critical because it means market discipline is weakened.

Historically, long business cycles have tended to generate talk of the "death of the business cycle." In the 1990s there was talk of the "new economy" that was supposed to have killed the business cycle by inaugurating a period of permanently accelerated productivity growth. The 2000s saw talk of the "Great Moderation" whereby central banks had tamed the business cycle through improved monetary policy based on improved theoretical understanding of the economy. This talk is not incidental. Instead, it constitutes broad evidence of the basic Minsky cycle at work. Improving times generate increased optimism, and that optimism afflicts all including regulators and policymakers. For instance, Federal Reserve Chairman Ben Bernanke (2004) declared himself a believer in the Great Moderation hypothesis.

The Minsky basic cycle is present in every business cycle and operates at the enterprise level. However, it is complemented by the Minsky supercycle that works over a period of several business cycles and operates at the system level. The super-cycle is a process of transforming business institutions, business practices and conventions, and the structures governing the market in a fashion that eventually gives rise to a major financial crisis.

Though Minsky did not write about financial cycles in terms of a dual cycle, doing so provides a way of coherently embedding his concerns about financial innovation, deregulation, and regulatory change which pepper his work. For instance, it is now widely recognized that securitization – the process of bundling loans and mortgages as single securities that are then resold – was an important factor in the development of the US house price bubble and the financial crisis of 2008. Minsky recognized presciently the financial stability implications of securitization and wrote some notes about it in 1987 (Minsky, 2008).

Another major concern of his was the structures of governance needed to ensure the stability of capitalist economies. Minsky (Ferri and Minsky, 1992) labeled those structures "thwarting institutions" in that they thwart instability. These thwarting institutions may be public or private, and their role is to "constrain the outcomes of capitalist market processes to viable or acceptable outcomes (Ferri and Minsky, 1992, p. 1)." Frequent bouts of instability of economic outcomes are not observed because "the economy has evolved usages and institutions, including

agencies of government, whose economic impact is to thwart the instability generating tendencies of the economy (Ferri and Minsky, 1992, p. 11)."

Perhaps the most important thwarting institution identified by Minsky was "big government" which stabilizes aggregate demand. Before the Great Depression, government spending in the US was around 5 per cent of GDP, but since then it has been around 20 per cent.

In the financial sector the most important thwarting institution is the central bank in its role as lender of last resort. Financial regulation that bars excessive risk taking by direct balance sheet composition restrictions and via measures such as margin requirements, capital requirements, and reserve requirements are other forms of thwarting institutions.

In international financial markets thwarting arrangements such as the Bretton Woods system that established adjustable fixed exchange rates and prevented competitive devaluation are another form. In the modern era of flexible exchange rates, the willingness of central banks to engage in currency swaps and the availability of emergency finance from the International Monetary Fund constitute today's international financial thwarting institutions.

In labor markets, wage setting conventions such as the "productivity plus inflation rule (Ferri and Minsky, 1991, p. 14)" that help sustain aggregate demand and ward off under-consumption constitute thwarting institutions. According to that logic, the minimum wage, unemployment insurance, and welfare protections are also thwarting institutions. So too are trade unions, as they ensure a distribution of income that maintains aggregate demand. However, this also illustrates how what qualifies as a thwarting institution will depend on theoretical perspective. Minsky was a progressive Keynesian, which influenced his identification of thwarting institutions.

The process of erosion and transformation characterizing the super-cycle takes several cycles, which is why the super-cycle is a long-phase cycle whereas the basic cycle is a shorter-phase cycle. However, both cycles take place simultaneously. Figure 8.3 illustrates the stages

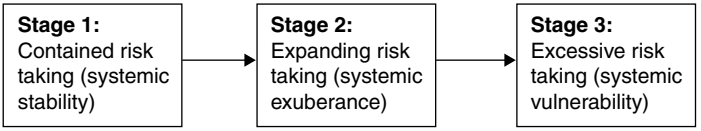

Figure 8.3 Stages of the Minsky super-cycle

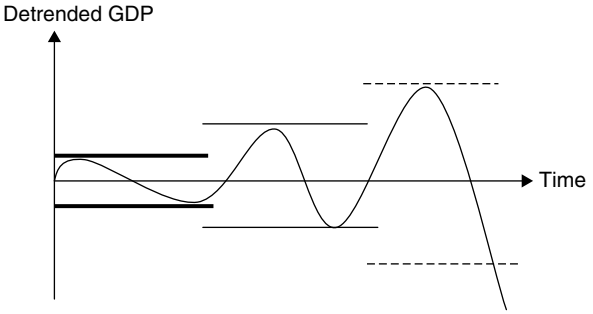

Figure 8.4 A symmetric Minsky super-cycle

of the Minsky super-cycle: systemic stability, systemic exuberance, and systemic vulnerability. Full-blown financial busts that threaten the survivability of the economy only happen "once a generation," when the Minsky super-cycle has had time to erode the economy's thwarting institutions. In between these busts only the Minsky basic cycle is visible.

The Minsky super-cycle works over a period of several Minsky basic cycles. This pattern of development is illustrated in Figure 8.4, which shows a gradually evolving cycle characterized by greater amplitude. This evolving amplitude is accompanied by symmetric weakening of thwarting institutions, which is represented by the widening and thinning of the bands determining the system's floors and ceilings. Eventually the thwarting institutions become sufficiently eroded and the embrace of financial excess is sufficiently deep that the economy experiences an uncontained cyclical bust. Once a full-scale bust occurs, the economy enters a period of renewal of thwarting institutions – which reasonably describes the current period (2009/10) when there is talk of renewed regulation.

This episodic history of construction and erosion of thwarting institutions is illustrated by US legislative financial history. Following the Great Depression there was an extended period of creation of financial thwarting institutions. This included the Glass–Steagall Act (1933); the Securities Act (1933); the Securities Exchange Act (1934); the Trust Indenture Act (1939); the Investment Advisers Act (1940); the Investment Company Act (1940); and the Banking Holding Company Act (1956).

The long process of erosion can be identified with market innovations such as the emergence of the eurodollar market in the 1960s as a way of escaping US banking regulation; the Garn–St.Germain Depository

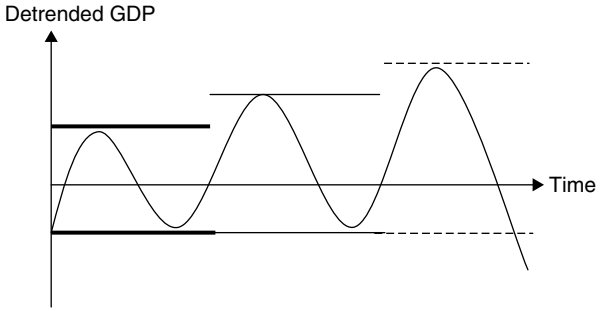

Figure 8.5 An asymmetric Minsky super-cycle

Institutions Act (1982) that de-regulated the saving and loan industry; and the Gramm–Leach–Bliley Act (1999) that repealed the Glass–Steagall Act and parts of the Bank Holding Act. If financial legislative history is an indicator, the creation and erosion of thwarting institutions is an asymmetric process. Creation of thwarting institutions tends to happen in bursts following crisis periods, while erosion and transformation takes place over a long-drawn-out period.

Figure 8.4 shows the case where economy undergoes cycles of symmetrically widening amplitude prior to the bust. However, there is no requirement for this. Another possibility is that cycles have asymmetrically changing amplitude. This alternative case is shown in Figure 8.5, and it gives Minsky's endogenous financial instability hypothesis an upward bias. Evolving excessive psychological optimism combined with financial innovations and regulatory change that remove constraints, together allow increasing financial excess that creates stronger booms. If paired with institutional arrangements like the Keynesian revolution in economic policymaking that put a floor under the economy, the super-cycle becomes asymmetric. Thus, it allows more upward movement while constraining downward movement, at least until the "big one" eventually hits.

Analytically, the full Minsky system can be thought of as a combination of three different approaches to the business cycle. The basic dynamic rests on a finance-driven version of Samuelson's (1939) multiplier-accelerator formulation of the business cycle. The thwarting institutions involve floors and ceilings and link Minsky's thinking to Hicks' (1950) construction of the trade cycle. The super-cycle aspect is then captured by shifting and weakening of floors and ceilings, which provides links to economists such as Schumpeter (1939).

The thwarting institutions are explicitly present in the floors and ceilings, but they may also be present in the coefficients of the multiplier-accelerator model which determine the responsiveness of economic activity to changes in such variables as expectations and asset prices. Minsky (see Delli Gatti et al., 1994) referred to all three types of cycle and his own early formal modeling (Minsky, 1959a, 1959b) made use of these modeling approaches.

However, the problem with formal modeling is it imposes too deterministic a phase length on what is in reality a historically idiosyncratic process. Adding stochastic disturbances jostles the process but does not adequately capture its idiosyncratic character, which Minsky (1993, p. 2) described as "One can never step in the same river twice." Modeling, which is the modern economist's obsession, may simply not be up to the task. Minsky realized this: "A model *per se*, however, is nothing else than a device for organizing thoughts. When deemed necessary, our description of financial developments will be richer and more detailed than that incorporated into the model (Delli Gatti et al., 1994, p. 4)."[3]

8.3 Details of the Minsky super-cycle

The Minsky super-cycle can be thought of as allowing more and more financial risk into the system. The cycle involves the twin developments of "regulatory relaxation" and "increased risk taking" that are shown in Figure 8.6. The process of regulatory relaxation can be identified with

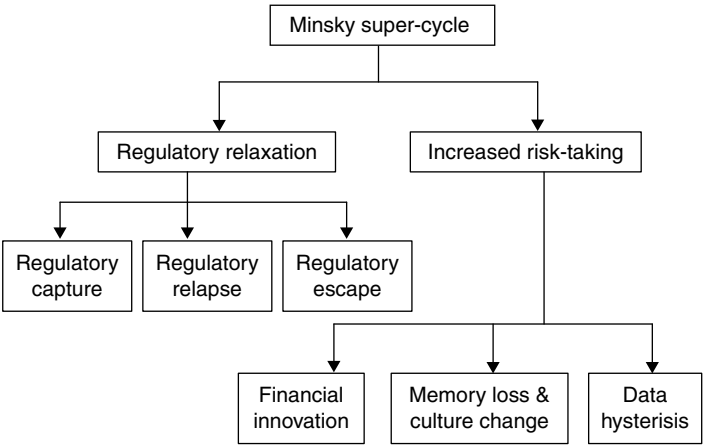

Figure 8.6 Details of the Minsky super-cycle

increasing the supply of risk, while the process of increased risk taking can be identified with increases of both supply and demand for risk.

There are three dimensions to the process of regulatory relaxation and increased supply of risk. The first is regulatory capture. Thwarting institutions limit the activities of financial institutions. If economically binding, these limitations reduce profits. That creates an economic incentive to capture regulatory agencies in order to weaken regulations. Such a process of capture has clearly been evident over past 25 years, and is now even acknowledged by mainstream economists (Johnson, 2009). Wall Street has stepped up its lobbying efforts, and there is a revolving door between Wall Street on one side and government on the other – in particular the Federal Reserve, the Treasury, and the Securities Exchange Commission.

The second dimension is regulatory relapse. Regulators are human and part of society, and like investors (see below) are subject to memory loss and reinterpretation of history. Thus, regulators forget the lessons of the past and buy into the rhetoric of death of business cycle. The result is willingness to weaken regulation, on grounds that things are changed and regulation is no longer needed. This shift in policy may be supported by developments in economics, driven by similar social forces, which provide an intellectual justification for such regulatory change.

The third dimension is regulatory escape. Thus, the supply of risk can increase through financial innovation that escapes the regulatory net because it was not conceived of when regulation was established. Innovation causes activity to spill outside the domain of thwarting institutions, and addressing innovation requires constant updating of regulation. This is the story of the shadow banking system and derivatives. However, the forces of regulatory capture and regulatory relaxation work against regulatory updating by challenging the will to maintain a comprehensive coherent system of regulation.

Effective regulation is a dynamic game played between market and regulator, and the market always seeks to escape regulation (Palley, 1998, p. 7). If regulation is economically binding in the sense of limiting the activities that the market participants would otherwise undertake, markets are likely to eventually innovate around the regulations. In effect, good regulation inevitably sows the seeds of its own destruction by providing an incentive to innovate, and this microeconomic logic is part of the Minsky super-cycle.

The process of increased risk taking also involves three dimensions. The first is financial innovation that provides new products, which allow more risk taking. Over the past two decades the household sector has

been introduced to home equity loans, lower mortgage down-payments, and a shift in pension arrangements from defined benefit plans to defined contribution plans where the ultimate payment depends on investments made. Financial markets have also created and expanded the use of a host of new products that facilitate financial risk taking. These include securitization and tranching of securities, derivatives, and options. All of these products allow households, business, and financial institutions to take on new patterns and changed levels of financial risk.

A second dimension of increased risk taking is the memory loss and culture change that increases the demand for risk. The passage of time contributes to the forgetting of earlier financial crises and that makes for a new willingness (or taste) to take on risk. The experience of the Great Depression permanently reduced the demand for equities among the 1930s generation – but baby boomers who never experienced the depression have been enthusiastic stock investors.

The phenomenon of memory loss is evident in the gradual decline and disappearance of the so-called "equity premium" – the excess return to stocks relative to bonds. As preferences for stock investing have been rebuilt, that has driven up the price of stock and reduced its relative return.

Another related factor is culture change, which may rely on memory loss as one of its drivers. This phenomenon is evident in the development of a "greed is good" culture, epitomized by the fictional character Gordon Gecko in the movie *Wall Street*. Similarly, investing has developed into a new form of entertainment, as reflected in phenomena like day trading and emergence of TV investment adviser personalities like Jim Cramer. Finally, culture change is evident in attitudes toward home ownership which is now interpreted as much as an investment opportunity as provision of a place to live.

The changing behaviors associated with memory loss and culture change fit with behavioral and evolutionary economics. Thus, the basic cycle and super-cycle may see herd behavior as patterns of imitation develop, while the super-cycle may see evolutionary mechanisms that lock in proclivity to risk taking via success and promotion. Managers and entrepreneurs who make profits come to dominate. Since risk-takers tend to make more profit, cautious investment managers and entrepreneurs will tend to fall behind over time, and the population of managers and entrepreneurs will be increasingly dominated by high rollers.[4] This process is reported by Zakaria (2008):

> Boykin Curry, managing director of Eagle Capital, says "For 20 years, the DNA of nearly every financial institution had morphed

> dangerously. Each time someone pressed for more leverage and more risk, the next few years proved them 'right.' These people were emboldened, they were promoted and they gained control over even more capital. Meanwhile, anyone in power who hesitated, who argued for caution, was proved 'wrong.' The cautious types were increasingly intimidated, passed over for promotion. They lost their hold on capital."

The third and final dimension of increased risk taking is data hysteresis, which is an inevitable feature of Minsky's view that the structure of the economy is continuously changing. That process of change inevitably generates data hysteresis. Crisis is followed by a period of rebuilding of risk thwarting institutions that reduces risks and changes the data outcomes generated by the system. Thereafter, there follows a long period marked by an uneven process of regulatory capture, regulatory relapse, regulatory escape, financial innovation, memory loss, and culture change. These developments mean that the data generating process is subject to continuous change so that time series analysis becomes a wholly inappropriate guide for action. However, that does not stop people using such analysis.

This problem is illustrated in Figure 8.7 which shows stylized risk–return trade-offs. As appetite and opportunities for risk taking increase owing to memory loss, financial innovation, and deregulation, agents move up their believed risk–return schedule. However, they are blind to the fact that the actual risk–return schedule has shifted because of changed structural conditions – including increased risk taking by all. Most importantly, this blindness applies on all sides of the market, including regulators, so that both market discipline and policy discipline increasingly fail to protect against the build-up of positions that

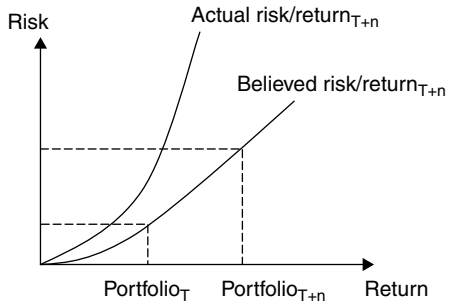

Figure 8.7 The changing pattern of risk and risk-taking

ultimately generate crisis. As shown by the chatter about the "Great Moderation," stories about the death of the business cycle and "this time is different" are believed by all – market participants and policymakers.

8.4 Minsky's broad intellectual appeal

Minsky's thinking about the economic process has broad and wide appeal, making it attractive to many different schools of thought. The Minsky super-cycle describes the economy as passing through stages in which thwarting institutions are eroded and the process eventually ends in crisis.

This emphasis on institutions makes it consistent with institutionalist economics. The "stages plus crisis" framework also resonates with the social structures of accumulation (SSA) school articulated by neo-Marxists such as (see for instance Kotz et al., 1994). It also resonates with the French regulationist school (see for instance Boyer and Saillard, 2002) that sees capitalism as organized by different regimes of production.

Minsky is a natural complement to both SSA and regulationist thinking, and adds to their thinking. First, he brings a focus on finance which has been relatively absent in SSA and regulationist thinking. Second, Minsky can be thought of as introducing a "double stage" approach that includes both long and short stages. Regimes can be thought of as defining the long stage. Regimes then undergo short stages of evolution – success breeds excess breeds failure – that end in crisis.

Minsky's construction of the emergence of different of stages of the cycle also fits neatly with an evolutionary approach to economics. Additionally, the role of changing psychology and expectations in driving the shift from hedge to speculative to Ponzi finance links Minsky to the new field of behavioral economics in which psychological factors and biases play a critical role.

Furthermore, the Minsky super-cycle is also consistent with the concept of hysteresis that has been emphasized by Post Keynesians (see Setterfield, 1997a, 1997b). For Minsky, history is a one-way train, and experience changes beliefs, understandings and priors in a way that cannot be reversed. Thus, the process of memory loss regarding prior crises is fundamentally hysteretic. So too is the changing pattern of data that results from changing behavior and changes in the institutional structure. This emphasis on history and the connection to hysteresis also connects with the ergodic–non-ergodic distinction that has been raised by Davidson (1991) and which challenges the legitimacy of using

probability theory to describe the likelihood of realizing different states of the world.

Minsky was an avowed Keynesian, and his approach is consistent with Keynesian economics that takes as its point of intellectual departure that capitalist economies are susceptible to crisis and are not automatically self-adjusting. New Keynesians (Bernanke et al., 1996; Bernanke, Gertler, and Gilchrist, 1999; Kiyotaki and Moore, 1997) have also tried to incorporate Minsky's thinking into their models through the notion of a financial accelerator. The logic is changes in asset prices increase the value of collateral, enabling increased borrowing that raises debt and ultimately gives rise to balance sheet congestion that causes downturns.

Though the new Keynesian financial accelerator succeeds in creating a financially driven business cycle, it is fundamentally different from Minsky's financial instability hypothesis. That is because New Keynesian models are philosophically inconsistent with Minsky, because they are stable equilibrium models that by definition cannot incorporate the financial instability hypothesis. In a new Keynesian world, rational agents would form expectations that peer into the future, recognize that the economy is headed on an unstable path, and immediately bring those implications to the present, forcing in place alternative stable arrangements.[5] This construction of the economic process fundamentally contradicts Minsky's construction, which is about the gradual inevitable evolution of instability that agents are blind to, yet is inherent in the structure and patterns of behavior.

The neoclassical application of rational expectations methodology that now dominates macroeconomics is methodologically incapable of incorporating Minsky's financial instability hypothesis. That is because it rests on a different construction of the economic process – one that is stable. Cycles can be generated by adding mechanisms like the financial accelerator, but Minsky is about more than cycles. Likewise, instability can be created by adding stochastic disturbances – "shocks" – but that completely misrepresents Minsky's instability, which is rooted in evolutionary process. In the neoclassical world crises can only occur because of shocks: hence the emphasis on fat-tailed probability distributions, perfect storms, black swans and other metaphors of chance. That is a fundamentally different construction of crisis from that contained in Minsky's financial instability hypothesis.

Square pegs cannot fit in round holes. Minsky is an intellectual square peg. Neoclassical rational expectations macroeconomics is an intellectual round hole. If the current financial crisis is indeed a vindication of Minsky's view of capitalism, then it means that neoclassical rational

expectations macroeconomics is fundamentally flawed as a description of capitalism.

8.5 The financial instability hypothesis as a reflexive process

Section 8.1 described Minsky as a process theorist. In many regards, Minsky's construction of the capitalist process is a fundamentally post-modern construction in that it embodies reflexivity. Reflexive processes are circular processes between cause and effect, whereby an effect bends back to impact the cause of the initial action. It is related to the concept of feedback.

The Minskian construction of the economic process in terms of "success breeds success breeds failure" can be applied more widely than just the financial business cycle. For instance, one application might be to popular understandings of unions and their economic effects. In the period after the Great Depression, trade unions were seen as a necessary institution for correcting excessive income inequality generated by the market and which threatened to undermine the system. Over time, as unions succeeded in bringing down income inequality, people may have begun to believe that the problem of income inequality was permanently solved, so that unions were no longer needed. Consequently, public support for unions may have declined, causing unions to shrink and the problem of income distribution to return.

A similar logic can be made regarding the relationship between Keynesian economics and neoliberalism. After World War II, Keynesian economics emerged triumphant, with the New Deal and the war having shown how demand management could restore full employment. This triumph was followed by a 25-year period in which the economy experienced historically fast growth, stable conditions, and low unemployment. However, that success may have led people to believe that the economic problem was permanently solved, and to forget the history behind this success. This memory loss may in turn have contributed to the retreat from Keynesianism and fostered the return of *laissez-faire* neoliberal understandings and economic policy.[6] In effect, Keynesian success at taming the economy helped create the space for the rebirth of instability via financialization.

The financial instability hypothesis, the evolution of attitudes about unions, and the evolution of thinking about the economy all embed a common Minskian meta-process. People's understanding of the economy evolves through time and people are involved in making the

outcomes that change their understandings. At the same time their initial understandings contributed to those outcomes. Thus there is a feedback loop that runs as follows: initial understandings → outcomes → new understandings.

This feedback loop is fundamentally reflexive. It is central to the Minsky super-cycle, and it has also been emphasized by the financier George Soros (1987). The looping process affects all – borrowers, lenders, regulators, and policymakers. It also affects economists and their knowledge claims. Thus, when the boom is on, economists can get caught up in the optimism of the boom – as perhaps evidenced by Federal Reserve chairman Ben Bernanke's endorsement of the "Great Moderation" hypothesis (Bernanke, 2004).

Even more importantly, as members of and participants in society, economists and policymakers will get caught up in the long wave that drives the super-cycle. That has implications for the contribution of economic policy to the erosion of thwarting institutions. Thus, the success of thwarting institutions in generating stable outcomes will create an environment in which agents and economists think the system is fundamentally changed. Market participants may then start to take on more risk as well as making political demands for new rules that allow more risk taking. Economists and policymakers may endorse this by arguing that things are changed and that the thwarting institutions are no longer needed or never really contributed to stability. This is reflexivity operating on a grand scale.

8.6 Policy implications

Hyman Minsky was first and foremost a theorist of the process of financial capitalism. However, his work also carries deep prescriptions for thinking about policy and policymaking. These policy prescriptions run significantly counter to the prescriptions generated by new classical and new Keynesian macroeconomics which have dominated economics for the past 30 years and have provided the justification for financial neoliberalism.

Policy prescription 1: Policymakers should exercise self-conscious skepticism toward the euphoria that accompanies a business cycle. Such euphoria is an inevitable product of the logic of the financial instability hypothesis.

Policy prescription 2: Capitalist economies need significant regulation to contain financial speculation and financial excess, because the

economy has an automatic behavioral tendency to instability. If Milton Friedman is the philosophical advocate of a deregulated economy, Hyman Minsky is the philosophical advocate of a regulated economy. For Friedman, the case for deregulation is to be found in the first welfare theorem of competitive general equilibrium theory. For Minsky, the case for regulation is to be found in the financial instability hypothesis. That justification is fundamentally distinct from the conventional market failure justification for regulation, which is rooted in competitive general equilibrium theory.

Policy prescription 3: A Minskian perspective emphasizes policy discretion over policy rules. Models, numbers, and rules are insufficient for policymaking. There is no substitute for judgment in policymaking, because the economy is governed by an evolutionary dynamic that has an inevitable tendency toward instability. Rules-based policy is unable to recognize and respond to this process. Instead, there is need for discretion combined with thwarting institutions. Indeed, those thwarting institutions might be considered Minsky's equivalent of rules.[7]

In sum, Minsky's financial instability hypothesis is a theory of the economic process under financial capitalism. As such, it provides a "big picture" window on the era of financialization. In Minsky's view, that economic process has an inevitable tendency to generate instability, through the combination of the Minsky basic cycle and the Minsky super-cycle. This means there is a key role for policy to thwart instability. The challenge for policymakers is both to identify incipient sources of instability and to ward off market participants whose private economic interests lead them to advocate abolition of the thwarting institutions that prevent instability. That advocacy can take the form of direct capture of regulators, policymakers, and politicians, as well as indirect capture implemented through capture of economic discourse.

Part III
Financialization and Growth

9
Inside Debt and Economic Growth

Chapter 4 explored the role of debt and financial market exuberance in the business cycle. Chapter 8 extended the analysis of cycles to incorporate the idea of a financial super-cycle that operates over several business cycles. This chapter further extends the time period of analysis to the long-run growth effects of financialization, particularly increased inside (that is, private sector) debt.[1]

The issue of growth is examined in a neo-Kaleckian framework. That framework connects the analysis with Chapter 3 which used a short-run neo-Kaleckian macro model. Chapter 3 explored financialization using a stages of development approach in which each stage corresponded to a short-run period with different institutional characteristics. This chapter uses a dynamic version of the neo-Kaleckian model that focuses on the rate of growth rather than the level of output.

The foundation of the neo-Kaleckian framework is the model of economic growth developed by such authors as Rowthorn (1982), Taylor (1983) and Dutt (1984, 1990). In these models growth is determined by the rate of capital accumulation which depends on the profit rate and the rate of capacity utilization. That core model is then supplemented by a model of income distribution in which the profit share and rate of profit depend on the rate of capacity utilization (Lavoie, 1995).

This chapter augments the core neo-Kaleckian growth model to incorporate the effects on growth of interest transfer payments between debtor and creditor units. This adds another dimension to the burgeoning

This chapter is a significantly revised version of an essay titled "Inside debt and economic growth: a neo-Kaleckian analysis that was published in *The Alternative Handbook of Growth Economics*, Mark Setterfield (ed.), Cheltenham: Edward Elgar, 2010.

literature on "financialization" that argues changes in the financial system over last 25 years may have lowered growth (Hein and Van Treeck, 2007; Skott and Ryoo, 2008; Stockhammer, 2004). The existing financialization literature tends to focus on the growth effects of an increased profit share and higher asset prices, whereas the current chapter focuses on the growth effect of higher indebtedness. The effect of debt on growth operates primarily through its impact on saving, which in turn affects capacity utilization and the profit rate. These latter two variables then impact investment and thereby affect growth.

The chapter is structured as follows. Sections 9.1 and 9.2 examine an economy with consumer debt issued through a bond market. Section 9.3 examines an economy with consumer debt financed by an endogenous money banking system. Section 9.4 examines an economy with corporate debt financed by an endogenous money banking system. Section 9.5 concludes the chapter. One major take-away is that intuitions derived from short-run macroeconomics can be misleading for growth theory. Thus, in short-run macro models higher inside debt levels lower economic activity but in a growth context higher debt can theoretically raise growth rates.

9.1 A growth model with bond market consumer debt

The first model to be considered is an economy in which there is consumer debt provided through a bond market in which debtor households borrow from creditor households. The bond market therefore transfers claims on income from creditors to debtors.

The model that is developed is related to one presented by Dutt (2006). However, Dutt's analysis is conducted under conditions of a fixed income distribution whereas the current model has an endogenous income distribution that is affected by the level of debt. The model also includes wage bill division effects and a stock market wealth effect.

The equations of the short-run static macro model are:

$$Y = C + I \tag{1}$$

$$C = C_D + C_C \tag{2}$$

$$C_D = z[1-\varphi]Y - iD + B \qquad 0 < \varphi < 1; 0 < z < 1 \tag{3}$$

$$C_C = \gamma_1\{[1-z][1-\varphi]Y + \varphi Y + iD - B\} + \gamma_2 V \qquad 0 < \gamma_1 < 1, 0 < \gamma_2 < 1 \tag{4}$$

$$V = qE \tag{5}$$

$$q = e\varphi Y/E \qquad e > 0 \tag{6}$$

Y = real output; C = aggregate consumption; I = investment; C_D = consumption of worker/debtor households; C_C = consumption of capitalist/creditor households; φ = the profit share; $1 - \varphi$ = wage share; z = worker households' share of the wage bill; i = real interest rate; D = level of debt; B = current period borrowing; V = value of stock market wealth; q = stock price; E = number of shares in issue; γ_1 = marginal propensity to consume (MPC) out of income of creditor households; γ_2 = MPC out of stock market wealth. Debtors have a MPC of unity which is higher than the MPC of creditors.

Equation (1) is the goods market equilibrium condition. Equation (2) defines aggregate consumption. Equations (3) and (4) are the debtor and creditor household consumption functions. Debtors are worker households who receive a share (z) of the wage bill and have a MPC of unity. They also make interest payments to creditors on their debt owed to creditors. Creditors are capitalist households and they own the capital and debt stocks in their entirety. They also receive a share (1 – z) of the wage bill in their role as managers. Equation (5) determines the value of stock market wealth. Equation (6) determines the stock price which is a multiple (e) of profits per share.

The level of aggregate saving is given by

$$S = Y - C_D - C_C \tag{7}$$

Substituting Equations (3), (4), (5) and (6) into (7) and collecting terms yields

$$S = \{1 - z[1 - \varphi] - \gamma_1\{[1 - z][1 - \varphi] - \gamma_1\varphi - \gamma_2 e\varphi\}Y + [1 - \gamma_1]iD - [1 - \gamma_1]B \tag{8}$$

Aggregate saving is assumed to be a positive function of Y. This implies the positive effect of disposable income on saving dominates the negative impact of an increased stock market wealth effect on consumption. Aggregate saving is increased by debt service transfers to creditors (iD) and decreased by debtor household borrowing (B). Increases in the wage share ($1 - \varphi$) reduce aggregate saving by transferring income to debtor/worker households who have a higher MPC than creditor/capitalist households. Increases in worker households' share of the wage bill (z) reduce aggregate saving by transferring wage income from managers to worker/debtor households.

The rate of capital accumulation and growth is determined as follows

$$I/K = g = \alpha_0 + \alpha_1 p + \alpha_2 u + \alpha_3 V/K \quad \alpha_0, \alpha_1, \alpha_2 > 0 \tag{9}$$

I = investment spending; K = capital stock; g = rate of growth; p = profit rate; u = rate of capacity utilization that is defined as Y/K. According

to Equation (9), the rate of capital accumulation is a positive function of the profit rate, the rate of capacity utilization, and the stock market valuation. The latter reflects a Tobin q effect on investment (Brainard and Tobin, 1968, 1977). The profit rate therefore operates on investment both directly and indirectly via the stock market.

Income distribution is determined in accordance with standard Kaleckian theory. The profit share is a positive function of the markup, given by

$$\varphi = \varphi(m) \quad \varphi_m > 0 \tag{10}$$

m = markup. The markup is in turn a positive function of the rate of capacity utilization, given by

$$m = m(u, \beta) \quad m_u > 0, m_\beta > 0 \tag{11}$$

β = shift factor reflecting the overall economic power of firms, both with regard to pricing of goods and bargaining of real wages with workers.[2] An increase in corporate power raises the markup. Combining Equations (10) and (11) yields

$$\varphi = \varphi(m(u, \beta)) = \Phi(u, \beta) \quad \Phi_u > 0, \Phi_\beta > 0, \tag{12}$$

The profit rate can be expressed as the profit share multiplied by the rate of capacity utilization. Given this, the profit rate is determined by

$$p = \varphi u = \rho(u, \beta) \quad \rho_u > 0, \rho_\beta > 0 \tag{13}$$

The profit rate is a positive function of the rate of capacity utilization and corporate economic power.

Short-run equilibrium requires that the goods market clear, which imposes the condition

$$I/K = S/K \tag{14}$$

Steady-state equilibrium imposes an additional condition that the debt stock grow at the rate of capital accumulation, which implies[3]

$$B/D = I/K \tag{15}$$

Cross-multiplying by D, substituting in for I/K = g, and dividing both sides by K, yields an expression for steady-state borrowing, given by

$$B/K = gD/K \tag{16}$$

Dividing Equation (8) by the capital stock yields the rate of saving with respect to the capital stock

$$S/K = s = \{1 - z[1-\varphi] - \gamma_1\{[1-z][1-\varphi] - \gamma_1\varphi - \gamma_2 e\varphi\}u + [1-\gamma_1]id - [1-\gamma_1]gd \tag{17}$$

$d = D/K$. Appropriate algebraic manipulation of Equation (17) then yields a quasi-general form expression for the saving rate, given by

$$s = \sigma(u, \varphi, z, \gamma_1, \gamma_2, e) + [1-\gamma_1][i-g]d$$
$$\sigma_u > 0, \sigma_\varphi > 0, \sigma_z < 0, \sigma_{\gamma 1} < 0, \sigma_{\gamma 2} < 0, \sigma_e > 0 \tag{18}$$

Equation (18) shows that the saving rate is driven by both income distribution and the debt level. The saving rate is positively related to the capacity utilization rate, the profit share, and creditors' propensity to consume out of income and wealth. It is negatively related to workers' share of the wage bill. The positive effect of the profit share reflects the assumption that the effect of the profit share on saving out of income dominates the stock market wealth consumption effect. The effect of higher debt on aggregate saving is ambiguous. On one hand, higher debt raises saving by increasing the interest transfer payment to higher saving creditor households ($[1 - \gamma_1]id$). On the other hand, it increases steady-state borrowing by debtor households ($[1 - \gamma_1]gd$) which finances additional consumption. This feature complicates the analysis of the effect of debt on growth. Lastly, a higher interest rate increases aggregate saving since debtor households pay more debt service to higher saving creditor households.

Appropriate substitution of Equations (6) and (13) into (9) yields a general form expression for the rate of capital accumulation, given by

$$I/K = g = \alpha_0 + \alpha_1\varphi u + \alpha_2 u + \alpha_3 e\varphi u = g(u, \varphi, e) \quad g_u, g_\varphi, g_e > 0 \tag{19}$$

The steady-state solution to the model is obtained by simultaneous solution of the following two equations

$$\varphi = \Phi(u, \beta) \quad \Phi_u > 0, \Phi_\beta > 0, \tag{20}$$

$$g(u, \varphi, e) = \sigma(u, \varphi, z, \gamma_1, \gamma_2, e) + [1-\gamma_1][i - g(u, \varphi, e)]d \tag{21}$$

The endogenous variables are capacity utilization (u) and the profit share (φ). Equation (20) determines the profit share as a function of capacity utilization and firms' power. Equation (21) is an investment–saving (IS) equilibrium condition obtained from Equations (9), (18), and (19).

Table 9.1 Conditions describing profit-led, wage-led, and conflictive regimes

	Capacity utilization	Rate of capital accumulation
Profit-led	$u_\beta > 0$	$g_u u_\beta + g_\varphi[\varphi_u u_\beta + \varphi_\beta] > 0$
Wage-led	$u_\beta < 0$	$g_u u_\beta + g_\varphi[\varphi_u u_\beta + \varphi_\beta] < 0$
Conflictive	$u_\beta < 0$	$g_u u_\beta + g_\varphi[\varphi_u u_\beta + \varphi_\beta] > 0$

As is widely recognized, the neo-Kaleckian growth model can be wage-led, profit-led, or conflictive (Bhaduri and Marglin, 1990; Taylor, 1983, 1991).[4] These distinctions refer to the effect of an exogenous increase in the profit share on capacity utilization and growth. In a wage-led economy an exogenous increase in the profit share lowers both capacity utilization and growth. In a profit-led economy it increases both capacity utilization and growth. In a conflictive economy an increase in the profit share lowers capacity utilization but increases growth.

These possible patterns arise because the profit share can differentially impact aggregate demand (AD) which determines capacity utilization and investment, which determines growth. A higher profit share immediately raises the profit rate, which increases investment and growth. In a profit-led economy the increase in investment is so strong that AD and capacity utilization also increase, thereby further increasing growth. In a wage-led economy, the increase in the profit share lowers consumption by more than it increases investment so that capacity utilization falls. Moreover, the fall in utilization is so large that investment also falls despite the higher profit rate, which lowers growth. In a conflictive economy, the fall in consumption lowers capacity utilization, but not by enough to reverse the initial increase in investment and growth due to the higher profit rate. These different effects on capacity utilization and the rate of capital accumulation are summarized in Table 9.1.

Totally differentiating Equations (20) and (21) with respect to u and φ and rearranging yields the slopes of the profit function (denoted PP) and the IS schedule in [u, φ] space. These slopes are given by

$$d\varphi/du|_{PP} = \Phi_u > 0$$

$$d\varphi/du|_{IS} = \{g_u - \sigma_u + [1-\gamma_1]dg_u\}/\{\sigma_\varphi - [1-\gamma_1]dg_\varphi - g_\varphi\} \gtrless 0$$

The slope of the PP function is unambiguously positive but the slope of the IS schedule is ambiguous. The numerator of the IS captures the sensitivity of AD to capacity utilization. The standard Keynesian multiplier

stability condition holds that saving is more sensitive to capacity utilization than investment, which implies the numerator is negative. Assuming this to be the case, the slope of the IS schedule is determined by the following condition $d\varphi/du|_{IS} \gtrless 0$ if $\{\sigma_\varphi - [1 - \gamma_1]dg_\varphi - g_\varphi\} \lesseqgtr 0$.

This condition can be related to the above discussion of wage-led versus profit-led growth. The IS is negatively sloped if $\{\sigma_\varphi - [1 - \gamma_1]dg_\varphi - g_\varphi\} > 0$. This condition holds that the saving rate is more sensitive to the profit share than the rate of capital accumulation, which corresponds to a wage-led economy. The IS is positively sloped if $\{\sigma_\varphi - [1 - \gamma_1]dg_\varphi - g_\varphi\} < 0$. This condition holds that the rate of capital accumulation is more sensitive to the profit share than the saving rate, which corresponds to a profit-led economy. Note, the inclusion of stock market effects on investment and saving make it more likely the IS is positively sloped because the stock market Tobin q channel increases g_φ while the stock market consumption wealth effect reduces σ_φ. The stock market therefore makes it more likely the economy is profit-led.

Figure 9.1 provides a graphical analogue of the model for a wage-led regime. The IS schedule and PP function jointly determine the equilibrium rate of capacity utilization and the profit share. The dynamics of the system are as follows. Output increases in response to excess demand and decreases in response to excess supply. Points to the right of the IS schedule correspond to excess supply which generates falling capacity utilization: points to the left correspond to excess demand which generates rising capacity utilization.[5] Lastly, firms are assumed to always set their markup according to Equation (9). Adjustment in response to disequilibrium conditions therefore takes place along the PP function.

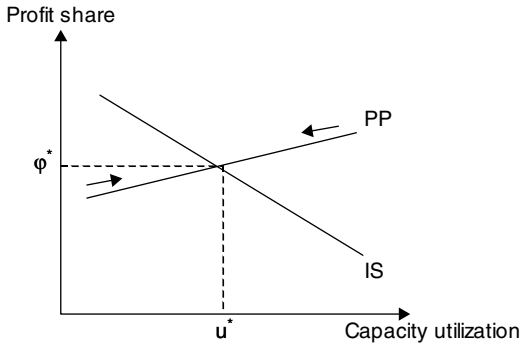

Figure 9.1 Determination of equilibrium profit share and capacity utilization in the wage-led case

Table 9.2 Comparative statics for a wage-led regime

	$d\gamma_1$	$d\gamma_2$	$d\beta$	dz	di	de	dd
du	+	+	−	+	−	+	?/−
$d\varphi$	+	+	+	+	−	+	?/−
dg	+	+	−	+	−	+	?/−

Putting the pieces together, for the wage-led regime this yields a pattern of adjustment shown by the arrows in Figure 9.1 in which the economy slides smoothly along the PP function to a position of equilibrium.

For the case of a profit-led regime the IS schedule is positively sloped in [u, φ] space. Points to the right of the again correspond to excess supply and points to the left correspond to excess demand. The profit-led regime is stable if the IS schedule is steeper than the PP function. In this case, excess demand conditions have the economy sliding along the PP function toward a point of goods market equilibrium on the IS. The economy is unstable if the PP function is steeper than the IS. In that case, excess demand in the goods market raises the markup and profit share, which further increases excess demand because the economy is profit-led and the economy slides along the PP function away from goods market equilibrium.[6]

The comparative statics for a wage-led regime are shown in Table 9.2 and they can be understood in terms of the ISPP diagram shown in Figure 9.1. An increase in creditor households' propensity to consume out of income (γ_1) lowers aggregate saving, shifting the IS right. With the profit share initially unchanged, increased consumption spending raises AD and capacity utilization. The result is a new equilibrium with a higher profit share, higher capacity utilization, and a higher rate of investment and growth. The same holds for an increase in the propensity to consume out of stock market wealth (γ_2).

An increase in corporate economic power (β) shifts the PP function up, which lowers capacity utilization and increases the profit share. Because the economy is wage-led the capacity utilization effect dominates the profit share effect and growth falls. An increase in the interest rate increases the income transfer from higher MPC debtor households to lower MPC creditor households, which increases aggregate saving. The IS therefore shifts left, lowering the profit share, capacity utilization, and growth.

An increase in worker/debtor households' share of the wage bill (z) transfers income from lower spending managers to higher spending consumers. That increases consumption and shifts the IS right, resulting in a new equilibrium with higher capacity utilization, a higher profit share, and a higher growth rate. An increase in stock market exuberance increases the stock market pricing multiple (e), which shifts the IS right and raises the profit share, capacity utilization, and growth.

An increase in the steady-state debt ratio (d) has a theoretically ambiguous effect on the IS for reasons discussed earlier. On one hand it increases the income transfer from debtor to creditor households, which increases aggregate saving and shifts the IS left. On the other hand debtor households have higher steady-state borrowing each period which has the opposite effect. If the negative income transfer effect dominates, saving increases, the IS shifts left, and the profit share, capacity utilization, and growth fall.

The comparative statics for a profit-led regime are the same as those for a wage-led regime, except for the effect of firms' power ($d\beta$). In this case, with a steep positively sloped IS schedule, the increase in firm power shifts the PP function up, increasing the profit share, capacity utilization and growth. In the profit-led regime, increased firm power raises growth.

The above analysis can now be used to understand the effects of financialization on growth. Financialization has increased the propensity to consume (γ_1, γ_2) and the stock market valuation multiple (e), all of which tend to increase growth regardless of regime. It has also shifted income toward profits by increasing firms' power (β). That lowers growth and capacity utilization in a wage-led regime; increases growth and capacity utilization in a profit-led regime; and raises growth but lowers capacity utilization in a conflictive regime. Which type of regime holds is an empirical question and the majority of studies appear to find that growth is wage-led (see Hein and Vogel, 2008; Stockhammer and Stehrer, 2011).

Financialization has also increased managers' share of the wage bill (lowered z), which lowers capacity utilization and growth in all regimes. As noted in Palley (2005a), dividing the wage bill between workers and managers means the economy can display both wage-led and profit-led characteristics. Thus, changing income distribution by shifting the wage bill toward workers will produce wage-led outcomes, yet the economy may still be profit-led with respect to the functional division of income between wages and profits.

Financialization has also increased debt ratios (d) but the effect of debt on depends on whether $i \gtrless g$. To the extent that financialization

pushes interest rates up in order to benefit finance capital via increased income transfers and low inflation, higher debt tends to lower steady-state growth. The fact that increased steady-state debt has a theoretically uncertain effect on growth shows that the intuitions of short-run macroeconomics do not automatically carry over to growth economics. In short-run macroeconomics, higher debt levels are contractionary, owing to the Fisher (1933) debt effect. However, in a growth context higher debt does not necessarily lower growth, and may even raise it. Higher debt raises interest transfers to creditors, which lowers φ and u in a manner consistent with short-run macroeconomics. But balanced against this, higher debt increases steady-state consumption borrowing by debtors, which raises φ and u.

9.2 Endogenous debt ratios

So far the model has assumed exogenous debt ratios. However, debt can be endogenized by assuming households are borrowing constrained and that their constraint varies with economic activity. Given debtors are always constrained by their debt ceiling, actual debt is then determined by the debt ceiling which is endogenous.

One possibility is credit markets impose on debtors a maximum debt interest service–income ratio, given by[7]

$$iD/\{z[1-\varphi]Y\} \leq \psi \quad z > 0 \tag{22}$$

ψ is the debt ceiling ratio. Rearranging, expressing in terms of capacity utilization, substituting for ϕ then implies a maximum D/K ratio given by

$$D/K = d_{MAX} = d(u, \varphi, z, i, \psi) \quad d_u > 0, d_\varphi < 0, d_z > 0, d_i < 0, d_\psi > 0 \tag{23}$$

Increased capacity utilization (u) and an increased worker share of the wage bill (z) raise the debt ceiling by increasing income of worker/debtor households. An increase in the profit share (φ) lowers the debt ceiling by reducing workers' income. A higher interest rate (i) lowers the debt ceiling, while an exogenous increases in the acceptable debt service burden (ψ) raises the debt ceiling.

Substituting Equation (23) into Equation (21) yields a new configuration of the ISPP model, given by

$$\varphi = \Phi(u, \beta) \quad \Phi_u > 0, \Phi_\beta > 0, \tag{24}$$

$$g(u, \varphi, e) = \sigma(u, \varphi, z, \gamma_1, \gamma_2, e) + [1-\gamma_1][i - g(u, \varphi, e)]d(u, \varphi, z, i, \psi) \tag{25}$$

Table 9.3 Comparative statics with endogenous debt

	i<g			i>g		
	du	$d\varphi$	dg	du	$d\varphi$	dg
$d\psi$	+	+	+	−	−	−
di	−	−	−	−/?	−/?	−/?
dz	+	+	+	+/?	+/?	+/?

The PP function is unaffected by the introduction of endogenous debt but the IS schedule is changed by endogenizing debt. The slope of the IS schedule is given by

$$dp/du|_{IS} = \{\sigma_u - [1-\gamma_1]dg_u + [1-\gamma_1][i-g]d_u - g_u\}/$$
$$\{g_\varphi - \sigma_\varphi + [1-\gamma_1]dg_\varphi - [1-\gamma_1][i-g]d_\varphi\}$$

The numerator is augmented by term $[1-\gamma_1][i-g]d_u$ which increases or decreases its magnitude depending on whether $i \gtrless g$. The denominator is augmented by the term $-[1-\gamma_1][i-g]d_\varphi$ which increases or decreases its magnitude depending on whether $i \lesseqgtr g$. If $i > g$ the absolute value of the slope of the IS increases, and if $i < g$ it IS decreases. Assuming the Keynesian multiplier stability condition holds, the numerator is positive.[8] In that case the economy is wage-led if the denominator is negative and profit-led if the denominator is positive.

Endogenizing the borrowing ceiling changes the comparative statics regarding the division of the wage bill (z) and the interest rate (i). Before, an increase in workers' share of the wage bill (z) was expansionary and shifted the IS right, while an increase in the interest rate (i) was contractionary and shifted the IS left. Now, the effects are ambiguous. Now, an increase in workers' share of the wage bill allows them to borrow more, but the steady-state effect of that increased debt depends on whether $i \gtrless g$. Table 9.3 shows the signing of the comparative statics. An exogenous increase in the debt ceiling (ψ) increases capacity utilization, the profit share, and growth if $i < g$, and lowers them if $i > g$. The logic is increased debt adds to borrowing, which pays for itself and stimulates growth if $i<g$. If $i > g$, it adds more to debt burdens than it does to aggregate demand.

Before, an increase in the interest rate was unambiguously contractionary via the debt burden effect. Now, an increase in the interest rate lowers the debt ceiling. This unambiguously increases the aggregate saving rate and lowers capacity utilization, the profit share, and growth if

$i < g$. If $i > g$, the effect is theoretically ambiguous because the lower debt level may result in reduced interest transfers to creditor households despite a higher interest rate, lowering the aggregate saving rate and raising growth.

Lastly, before, an increase in workers' share of the wage bill was unambiguously expansionary because it reduced the aggregate saving rate. If $i < g$, it still transfers income to worker household and allows them to borrow more, both of which effects are expansionary. If $i > g$, the latter effect will be contractionary because the interest burden on the additional borrowing is high, and that could theoretically overwhelm the wage income transfer effect on the aggregate saving rate.

Financialization has increased the debt ceiling via financial innovation (ψ); lowered the worker share of the wage bill (z); and increased the real interest rate (i). Its effects are theoretically contingent on whether $i \gtrless g$. The latter two effects have likely lowered growth. The first has lowered growth if $i > g$ and increased it if $i < g$.

9.3 Growth with endogenous money bank financed consumer debt

The previous section examined the growth effects of debt when debt is financed through a bond market. This section presents a model in which there is endogenous money and debt is financed through the banking sector which creates loans. Previously, Palley (1997) has examined the business cycle effects of such arrangements.

The critical feature of a model with endogenous money is that lending creates money balances. Loans are issued to borrowers and the process of loan issuance creates money. Those money balances are spent by debtors and accumulated by creditors who own the businesses that produce the goods and services debtor households purchase.

Introducing endogenous money bank credit results in a respecified short-run model, given by

$$Y = C + I \tag{26}$$

$$C = C_W + C_C \tag{27}$$

$$C_D = z[1-\varphi]Y - iD + B \qquad 0 < \varphi < 1; 0 < z < 1 \tag{28}$$

$$C_C = \gamma_1\{[1-z][1-\varphi]Y + \varphi Y + iD\} + \gamma_2 V + \gamma_3 M$$
$$0 < \gamma_1 < 1, 0 < \gamma_2 < 1, 0 < \gamma_3 < 1 \tag{29}$$

$$D = M \tag{30}$$

M = endogenous money stock; γ_3 = propensity to consume out of money wealth. Debtor households' consumption function is unchanged and changes only concern creditor households' consumption function. Now, creditors no longer transfer claims on income to debtor households via the bond market. Furthermore, bank lending creates money that circulates back to creditors who are the wealth owners. Thus, in addition to receiving interest transfers from debtors paid via banks, creditors also have a money stock consumption wealth effect. An endogenous money bank credit system therefore adds two source of expansion. First, there is no initial transfer of income claims to debtors. Second, it creates money that gives rise to an additional wealth effect.

Aggregate saving is given by

$$S = Y\{1 - [1 - \varphi]z - \gamma_1\{[1 - \varphi][1 - z] - \gamma_1\varphi - \gamma_2 e\varphi\} + [1 - \gamma_1]iD - B - \gamma_3 D \tag{31}$$

The saving rate is given by

$$\begin{aligned} S/K = s = \{1 - z[1 - \varphi] - \gamma_1\{[1 - z][1 - \varphi] - \gamma_1\varphi - \gamma_2 e\varphi\}u \\ + [1 - \gamma_1]id - gd - \gamma_3 d \end{aligned} \tag{32}$$

This can be expressed in quasi-general form as

$$s = \sigma(u, \varphi, z, \gamma_1, \gamma_2, e) + \{[1 - \gamma_1]i - g - \gamma_3\}d \quad \sigma_u > 0, \sigma_\varphi > 0, \sigma_z < 0, \quad \sigma_{\gamma 1} < 0, \sigma_{\gamma 2} < 0, \sigma_e > 0 \tag{33}$$

The money wealth effect therefore reduces aggregate saving (s). It also diminishes the negative effect of debt on aggregate demand. This is because borrowing creates both debt and money. Interest service payments by debtors increase saving and reduced aggregate demand, but the money wealth effect on creditor consumption reduces saving and increases aggregate demand.

The above description of saving in an endogenous credit money economy can then be combined with the model of capital accumulation given by Equation (9) and the model of the profit share given by Equation (12). This yields an ISPP model that is structurally similar to the model described in Section 9.1. The PP function is exactly as before, and the IS schedule has the same slope as before.

The only change is that for a given level of debt, saving will be lower in an endogenous money economy owing to the fact that creditor households no longer finance steady-state borrowing of debtors, and because of the money wealth effect. Consequently, the IS schedule will be shifted

to the right compared to the bond market economy. That means u and φ will be higher, which in turn means growth will be higher. This holds for wage-led, profit-led, and conflictive economies.

9.4 Growth effects of corporate debt

Corporations also issue debt and that gives rise to transfers between corporations and creditor households (Lavoie and Godley, 2001/02; Palley 2004c). This section presents a simple growth model with corporate debt. Once again debt financing can be through bond markets or through banks, or a combination of both. The model that is presented assumes bond market financing.

In the real world, economies have both household and corporate borrowing. However, to simplify the model and spotlight the additional implications that come from adding corporate borrowing, the model in this section only has corporate borrowing. That assumption means there is no need to distinguish between debtor and creditor households and, instead, there is a single household sector that is a creditor and owns the corporate sector's debt.

The major theoretical innovation that comes with corporate debt concerns the investment function which is modified to include a corporate cash flow effect. This effect has been emphasized in the empirical literature on investment (Fazzari et al., 1988), and the cash flow effect provides the channel whereby the corporate sector feels the burden of debt. As before, debt is a two-edged phenomenon. On one hand, corporate debt has a positive growth effect because it increases households' income through payment of interest. That spurs consumption, raising capacity utilization and investment.

On the other hand, interest payments on corporate debt reduce firms' cash flows, which has a negative effect on investment spending. Because there is no consumer debt there is no need to disaggregate the household sector into debtor and creditor households. Consumption can therefore be represented by a single consumption function, given by

$$C = [1-\varphi]Y + \gamma_1\{[1-\lambda]\varphi Y + iD\} \qquad 0 < \gamma_1 < 1, 0 < \varphi < 1, 0 < \lambda < 1 \tag{34}$$

λ = share of profits retained by firms. Households are assumed to adopt a "rule of thumb" approach to saving whereby they consume all wage income and save out of dividends and interest income as originally assumed by Kalecki (1943) and Kaldor (1955/56).

Aggregate saving now consists of saving by the household sector and corporate sector, and it is given by

$$S = S_H + S_F = Y - C \tag{35}$$

Corporate sector saving is equal to retained profits and is given by

$$S_F = \lambda\varphi Y \tag{36}$$

Substituting Equation (34) into (35) and collecting terms yields

$$S = \varphi Y\{1 - \gamma_1[1 - \lambda]\} - \gamma_1 iD \tag{37}$$

Dividing by the capital stock yields aggregate saving per unit of capital

$$\begin{aligned} s = S/K &= \varphi u\{1 - \gamma_1[1 - \lambda]\} - \gamma_1 id \qquad (38)\\ &= \sigma(u, \varphi, \lambda, \gamma_1) - \gamma_1 id \qquad \sigma_u > 0, \sigma_\varphi > 0, \sigma_\lambda > 0, \sigma_{\gamma 1} < 0 \end{aligned}$$

Higher capacity utilization increases aggregate income and aggregate saving. A higher profit share increases aggregate saving, increasing both household and corporate saving. A higher profit retention ratio also increases aggregate saving. Though it reduces household saving, an increased retention ratio increases aggregate saving because firms have a marginal propensity to save out of retained profits of unity. Lastly, higher debt and a higher interest rate both lower aggregate saving. The logic is that this increases interest income of households, which raises their consumption and lowers saving.

The second change to the model concerns investment and the determination of the rate of capital accumulation which is given by

$$I/K = g = \alpha_0 + \alpha_1\varphi + \alpha_2 u + \alpha_3 V/K + \alpha_4 F/K \qquad \alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4 > 0 \tag{39}$$

F = real retained cash flows. The only change from earlier model is the addition of a positive cash flow effect on investment. Cash flows are defined as

$$F = \lambda\varphi Y - iD + B \tag{40}$$

Substituting Equations (5), (6), (16) and (40) into (39) and collecting terms yields:

$$\begin{aligned} g &= \{\alpha_0 + \alpha_1\varphi + \alpha_2 u + \alpha_3 e\varphi u + \alpha_4[\lambda\varphi u - id + gd] \qquad (41)\\ &= g(u, \varphi, e, \lambda, \alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4) - \alpha_4[i - g]d \quad g_u > 0, g_\varphi > 0, g_e > 0, g_\lambda > 0,\\ &\qquad g_{\alpha 0} > 0, g_{\alpha 1} > 0, g_{\alpha 2} > 0, g_{\alpha 3} > 0, g_{\alpha 4} > 0 \end{aligned}$$

Increases in the profit retention ratio (λ) increase the investment rate because they increase cash flow. Increases in the interest rate reduce capital accumulation because they reduce firms' cash flow. Higher debt lowers accumulation if $i > g$ and increases accumulation if $i < g$ for familiar reasons. If the interest rate is less than the growth rate, the expansionary effect from a higher steady-state borrowing rate outweighs the interest burden effect and debt essentially pays for itself.

As before the model reduces to a two-equation ISPP framework, given by

$$\varphi = \Phi(u, \beta) \tag{42}$$

$$g(u, \varphi, e, \lambda, \alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4) - \{[\alpha_4 - \gamma_1]i - \alpha_4 g\}d = \sigma(u, \varphi, \lambda, \gamma_1) \tag{43}$$

Comparative statics are as follows. Increases in the stock market valuation multiple (e) and the coefficients of the investment function (α_0, α_1, α_2, α_3, α_4) shift the IS right and raise capacity utilization, the profit share, and the growth rate in all economic regimes.

An increase in firms' retention ratio has an ambiguous effect. First, it reduces household saving by reducing distributed profit income, but this reduction in household saving is more than offset by an increase in corporate saving. Second, it increases investment spending by increasing cash flow. Consequently, the direction of shift of the IS is ambiguous.

An increase in the interest rate has a negative impact on capacity utilization, the profit rate, and growth if $\alpha_4 > \gamma_1$, and a positive effect if $\alpha_4 < \gamma_1$. A higher interest rate negatively affects investment by lowering firms' cash flows, but it positively affects consumption by increasing household interest income. The IS shifts left and growth falls if the former dominates, and it shifts right and growth rises if the latter dominates.

Finally, a higher debt has a negative impact on capacity utilization, the profit rate, and growth if $[\alpha_4 - \gamma_1]i > \alpha_4 g$, and a positive effect if $[\alpha_4 - \gamma_1]i < \alpha_4 g$. Higher steady-state debt raises the net interest burden on aggregate demand ($[\alpha_4 - \gamma_1]i$) but it also raises steady-state borrowing which finances investment and increases aggregate demand.

9.5 Conclusion

Inside debt is a fundamental feature of capitalist economies. This chapter has examined the growth effects of consumer and corporate debt using a neo-Kaleckian growth framework. According to this framework inside debt has an ambiguous effect on growth. This is counter to the intuition of static short-run macro models in which higher debt levels always lower

economic activity, and it shows that intuitions of short-run macroeconomics do not always carry over automatically to growth theory. The reason is higher steady-state debt raises the interest burden on aggregate demand but it also raises steady-state borrowing that finances aggregate demand.

Growth is faster in endogenous money economies than in pure credit economies, *ceteris paribus*. That is because lending in endogenous money economies creates money wealth that increases spending and lowers saving, resulting in higher capacity utilization and faster growth.

Interest payments from debtors to creditors are a critical channel whereby debt affects growth. In the consumer debt model this interest transfer mechanism exerts an unambiguous negative influence on growth by transferring income from low saving debtor households to higher saving creditor household. However, in the corporate debt model the effect of higher interest rates is ambiguous. Increased interest transfers can raise growth if the marginal propensity to consume of households out of interest transfer income exceeds firms' marginal propensity to invest out of cash flow. In the neo-Kaleckian growth model with corporate debt higher interest rates can therefore be expansionary, again challenging the conventional assumptions of short-run macroeconomics.

Financialization impacts growth via many channels. It has had a positive growth effect by lowering the propensity to save and increasing the stock market valuation ratio. It has had a negative effect by increasing managers' shares of the wage bill. It has also increased the profit share, the impact of which depends whether the economy is wage-led, profit-led, or conflictive. To the extent it has raised interest rates, that has exerted a negative impact via household debt and, possibly, via corporate debt too. Finally, it has increased indebtedness, the growth effect of which depends on whether the interest rate is greater than or less than the growth rate.

Part IV
Financialization and Policy

10
A Monetary Policy Framework for Asset Price Bubbles

Previous chapters have provided an empirical and theoretical analysis of financialization's economic impact; the final three chapters of the book turn to issues of economic policy. In this regard, there are two sets of policy issues. The first is how to stabilize and improve the performance of financial markets. The second is how to reverse financial neoliberalism and replace it with a structural Keynesian regime.

In the decade preceding the financial crisis of 2008 central bank policy thinking was increasingly dominated by inflation targeting. The USA, which was ground-zero for the financial crisis, made inflation its primary focus even though it stopped short of a formal inflation target. Side by side with this focus on inflation there was also an explicit opposition to targeting asset markets and asset price bubbles from both former Federal Reserve Chairman Alan Greenspan and current Chairman Ben Bernanke.[1] That policy configuration – a focus on low inflation plus relative neglect of asset markets – failed to prevent the build-up of massive financial fragility, proving it to be seriously flawed.

This chapter explores the failings of the conventional wisdom's opposition to targeting asset markets, and presents a policy framework for reining in asset and credit markets. That framework is based on a system of asset-based reserve requirements that can enhance counter-cyclical monetary policy.

The Greenspan–Bernanke opposition to targeting asset bubbles has two components. First, there is the purely pragmatic objection that it is not possible to identify bubbles in advance. Second, there is a theoretical

This chapter was first published as "Asset price bubbles and monetary policy: why central banks have been wrong and what should be done," *Intervention*, 7(1) (2010): 91–107.

objection, which is that explicit asset price targeting is not desirable. In part, this is because even if bubbles could be identified, it would not be possible to pop them without exposing the economy to enormous collateral damage. For Bernanke (2002), the asset bubble problem should be addressed by regulatory and supervisory measures rather than by activist policy.[2]

The chapter argues against that theoretical position and makes the case for a particular form of activist policy which has general application as part of counter-cyclical monetary policy. The chapter begins by presenting a simple macro model that illustrates why monetary authorities should be concerned about asset bubbles and why conventional policy may be unable to reverse their effects even if implemented rapidly. Not only do asset bubbles distort economic activity when they are inflating, but they also leave behind damaging effects that can reduce activity long afterward. This provides the policy rationale for actively addressing them.

Thereafter, the chapter presents a policy framework based on asset-based reserve requirements (ABRR) that permits activist anti-bubble policy interventions but does not use the tool of interest rates, which impose unacceptable collateral damage on the rest of the economy. ABRR give the monetary authority additional new policy instruments that can be specifically targeted on asset prices, thereby avoiding the collateral damage problem and circumventing the main argument against activist anti-bubble policy.

The chapter does not address the "bubble identification" argument. This is an empirical question, but there are strong commonsense grounds for believing that bubbles can be identified. Stock market bubbles can be identified through measures such as cyclically adjusted stock market price/earnings ratios, while house price bubbles can be identified through measures such as house price/income ratios and house price/rental ratios. There are of course difficulties and risks (Type I and Type II errors) related to bubble identification, but the conduct of monetary policy always involves judgment and risk. That even holds for formal rule-based policies as the rule needs to be selected and implemented. If monetary authorities can make reasonable judgments about potential output, potential growth, and expected inflation, they can also make reasonable judgments about asset price bubbles.

10.1 Central bankers' new economic model

Central bankers' opposition to targeting asset price bubbles can be understood in terms of the theoretical framework that guides their thinking

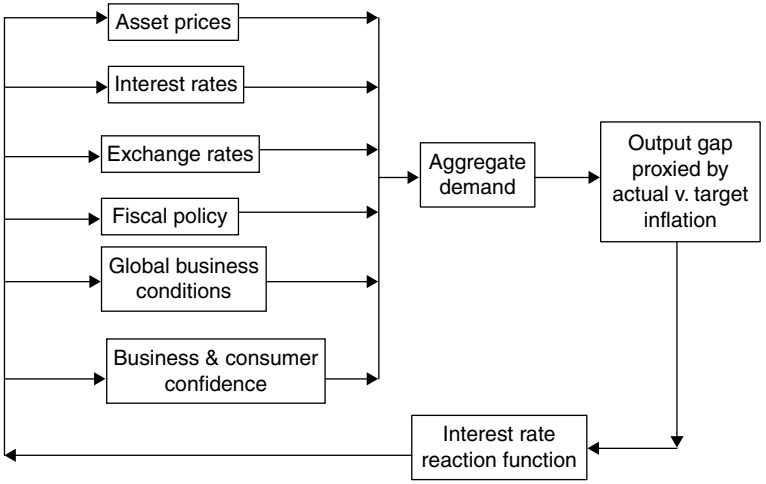

Figure 10.1 The new consensus model of monetary policy

about inflation. This framework has been labeled the "new consensus" macro model (Arestis and Sawyer, 2006). Figure 10.1 provides a stylized representation of the new consensus model. The level of aggregate demand (AD) drives fluctuations in the output gap, which in turn drive the inflation rate and its deviation from target (be it explicit or implicit). The monetary authority then responds to these deviations according to its interest rate reaction function, a form of the so-called "Taylor rule," and its interest rate response causes an adjustment of AD that brings output and inflation back in line with target.

The important feature of the model is that asset prices are viewed as just one of many factors influencing AD. Thus, in Figure 10.1 asset prices enter into the funnel of AD along with business and consumer confidence, global economic conditions, fiscal policy, exchange rates, and interest rates. According to this view, asset price bubbles are just one contributing factor to AD and are no more worthy of a central bank's specific attention than is the state of business confidence. Just as a central bank would not try to target the state of confidence, it should not try to target asset prices. Instead, it should manage the overall level of AD.

This view of the economy and the resulting approach to stabilization policy can be captured by the following simple model. Output is determined by the level of AD and is given by

$$y = E(y, i_L, P_A, \ldots) \quad E_y > 0, E_{iL} < 0, E_{PA} > 0 \tag{1}$$

y = output, E(.) = AD function, i_L = market loan rate, P_A = price of assets. Equation (1) is the conventional Keynesian IS function in which AD depends positively on the level of income, negatively on the loan interest rate, and positively on asset prices.

The market interest rate is determined in the financial sector according to

$$i_L = i_F + m \tag{2}$$

i_F = the central bank's policy interest rate (which in the USA is the federal funds rate), and m = commercial bank interest rate markup. Equation (2) replaces the old Keynesian LM schedule and captures the reality of interest rate determination in a world of endogenous credit money in which the central bank sets the short-term money market rate. The markup reflects the liquidity preference of financial market institutions, and can be considered a catchall for the state of financial market confidence and attitudes toward assessment of risk.

The central bank chooses its target interest rate with the goal of hitting its output target, y*. This generates a federal funds rate, determined by

$$i_F^* = E^{-1}(y^*, m, P_A, \ldots) \quad \delta i_F^*/\delta y^* < 0, \delta i_F^*/\delta m < 0, \delta i_F^*/\delta P_A > 0 \tag{3}$$

The target interest rate is a negative function of the output target (y*), a negative function of the financial sector's markup (m), and a positive function of asset prices (P_A) and other factors positively influencing AD.[3]

The model is illustrated in Figure 10.2. A higher output target (y*) requires a lower target interest rate (i_F^*) because the monetary authority must bring down the market interest rate (i_L) to increase AD. Likewise, a higher financial sector markup (m) requires a lower target interest rate. The reason is that to obtain the market interest rate needed to hit the output target, the monetary authority must bring down the base cost of funds.

Asset prices affect AD by working through the common funnel described in Figure 10.1. The effect of an asset price bubble, as understood within the conventional paradigm, is illustrated in Figure 10.3. A bubble-induced increase in asset prices causes the IS to shift up. That induces the central bank to raise its target interest rate in order to maintain AD at a level consistent with its output target. After the bubble is over, the IS shifts back down and the central bank then lowers its target interest rate. The underlying assumption is that economic conditions are smoothly reversible and that consequently after a bubble the central bank can engineer a return to the initial equilibrium conditions.

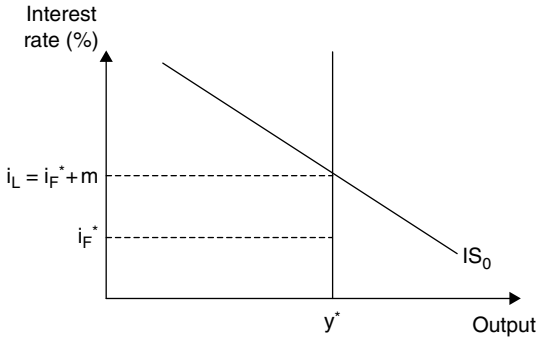

Figure 10.2 Determination of the central bank's policy interest rate and the loan market rate

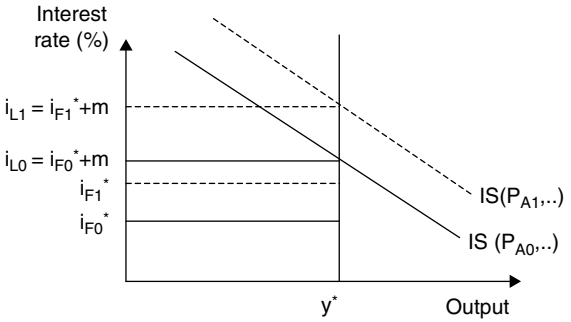

Figure 10.3 Asset bubbles and central banks' model

10.2 Why central bankers' model is wrong

There are several major problems with the above model that central banks have used to respond to asset bubbles. First, the model ignores the fact that bubbles impose economic distortions that have real costs. For instance, the US internet stock market bubble of the 1990s likely distorted investment by making too much capital available at too low a price to internet companies. The US house price bubble, which peaked in 2006, distorted economic activity by driving up house prices and causing excessive residential investment.

A second failing of central bankers' model is that it ignores the fact that there are real costs from using interest rates to combat the inflationary

pressures unleashed by bubbles. Such costs can be termed "blunderbuss" effects, and they refer to the adverse impacts that increased interest rates have on sectors other than those affected by an asset bubble. Thus, raising interest rates to counter a bubble can adversely change the composition of output, giving rise to negative long-term effects. One problem is that higher interest rates may decrease investment spending, which in turn reduces future productivity and output. A second problem is that higher interest rates may appreciate the exchange rate, adversely impacting the trade balance and manufacturing. If the appreciation is prolonged, that can accelerate de-industrialization and increase the adjustment strains of globalization. Consequently, blunderbuss effects can have both short- and long-run impacts on manufacturing and growth.

A third blunderbuss effect concerns income distribution (Thorbecke, 1997). Thus, higher interest rates adversely affect borrowers and benefit creditors, who receive higher interest payments. To the extent that many middle- and lower-income households are net borrowers, higher interest rates tend to worsen income distribution. That means using the interest rate tool to fight bubbles may compound income inequality because asset price bubbles disproportionately benefit the wealthy, while fighting bubbles with interest rates disproportionately hurts net borrowers who are the less wealthy.

The third and most important failing of central bankers' model is the omission of debt "footprint" effects. These footprint effects refer to financial stock effects that linger after a bubble is over if the bubble has been financed by borrowing. When interest rates come down after the bubble, past borrowing imposes debt burdens that can weigh down the economy. The monetary authority may then be unable to adequately offset the AD effects of these burdens because of the zero lower bound (ZLB) to nominal interest rates.[4]

The working and impact of debt footprint and interest rate blunderbuss effects can be incorporated into a modified version of the above model. Now, the goods market is described shown by the following IS equation

$$y = E(y, i_L, P_A, B, D_{-1}, \ldots) \quad E_y > 0,\ E_{iL} < 0,\ E_{PA} > 0,\ E_B > 0,\ E_D < 0 \quad (4)$$

B = this period borrowing, and D_{-1} = last period's debt stock. The current flow of borrowing (B) has a positive impact on AD, while last period's debt stock (D_{-1}) has a negative impact. It is this debt stock that gives rise to debt footprint effects.

Additionally, aggregate demand is decomposed into consumption, investment, net exports, and government spending as follows:[5]

$$\begin{aligned} E(.) &= C(y, i_L, P_A, B, D_{-1}, \ldots) + I(i_L, e(i_L), D_{-1}, \ldots) \\ &\quad + G + X(e(i_L)) - M(y, e(i_L)) \\ & C_y > 0,\ C_{iL} < 0,\ C_{PA} > 0,\ C_B > 0,\ C_D < 0, \\ & I_{iL} < 0,\ I_e < 0,\ I_D < 0, \\ & X_e < 0,\ M_y > 0,\ M_e > 0,\ e_{iL} > 0 \end{aligned} \tag{5}$$

C = consumption, I = investment, G = government spending, X = exports, M = imports, e = exchange rate (FX/domestic currency), –1 = last period level. Investment spending is a negative function of the interest rate, the exchange rate, and the level of debt.[6] Likewise, exports are negatively affected by the interest rate, which appreciates the exchange rate and lowers net exports. Imports are positively affected by exchange rate appreciation.

The financial sector is described as follows:

$$i_L = i_F + m(D_{-1}, ..) \quad m_D > 0 \tag{6}$$

$$D = D_{-1} + B(\Delta P_A, \ldots) \quad B_{\Delta PA} > 0 \tag{7}$$

$$P_A = P_{A-1} + \Delta P_A \tag{8}$$

ΔP_A = change in asset prices. Equation (6) determines the loan rate as a markup over the central bank's target interest rate (which in the USA is the federal funds rate), but now the markup is a positive function of the debt stock. This reflects the fact that increased indebtedness increases borrower riskiness, resulting in increased credit spreads – a feature that was clearly visible in the financial crisis of 2008. Equation (7) determines the evolution of the debt stock, which is equal to last period's debt plus this period's borrowing. This period's borrowing is a positive function of the change in asset prices.[7] Equation (8) determines the evolution of asset prices, with the term ΔP_A capturing the effect of a bubble.

The central bank sets its target interest rate as follows

$$i_F = i_F^* \tag{9}$$

$$i_F^* = E^{-1}(y^*, P_A, B(\Delta P_A), D_{-1}, \ldots) \geq 0 \tag{10}$$

Thus, the policy interest rate is set with an eye to hitting the output target. The policy rate is affected by asset price bubbles through their impact on borrowing and AD. Confronted by a bubble that increases

AD, the central bank raises its policy rate to neutralize the bubble's AD impact.

The blunderbuss effect of interest rate policy operates via Equation (5). An asset price bubble increases AD, causing the central bank to raise rates. This has a negative impact on investment spending. It also appreciates the exchange rate, which has a negative effect on exports and a positive effect on imports. Such blunderbuss effects were clearly present in the US economic expansions of 2001 to 2007. Thus, as the Fed gradually raised interest rates to try and slow the house price bubble and construction boom, this contributed to a strong dollar, record trade deficits, and weak non-residential investment spending.

The debt footprint effect works through both goods markets and the financial sector. Asset price bubbles increase consumption spending via the wealth effect and via increased borrowing. Increased borrowing raises debt, which then creates a debt footprint effect. The following period, when the bubble is over, the economy is left with a debt footprint that exerts a direct drag on spending in the goods market (Equation (5)). Additionally, the increase in debt causes financial institutions to increase their credit markup, widening the spread between the policy interest rate and the market loan rate (Equation (6)). The net result is that AD contracts directly, and the market interest rate rises yielding a negative indirect effect on AD. Both types of effect have been visible in the wake of the bursting of the US house price bubble.

From a policy perspective the danger is that the economy may get stuck in a post-bubble trap, such as is illustrated in Figure 10.4. The source of the problem is the zero lower bound to the policy nominal interest rate. Thus, given post-bubble depressed AD conditions and higher interest rate markups, the monetary authority may not be able to push its policy interest rate to a level sufficiently low to achieve its real output target. In Figure 10.4, full employment requires a loan rate of i_L^*, which in turn requires a central bank target rate of $i_F^* < 0$. That is not possible because of the zero lower bound, and instead the central bank must settle for a policy rate of $i_F^* = 0$. As a result the loan rate is $i_L = m(.) > i_L^*$, leaving the economy demand constrained and short of full employment.

This post-bubble trap was evidenced in Japan in the 1990s, and it is now being experienced in the USA in the wake of the implosion of its house price bubble. The UK also appears to be caught in the same trap.

Furthermore, pushing interest rates down to artificial lows can have its own blunderbuss effects. Thus, just as raising the interest rate distorted the composition of economic activity, so too can excessively lowering it. In particular, this can produce exchange rate depreciation that causes

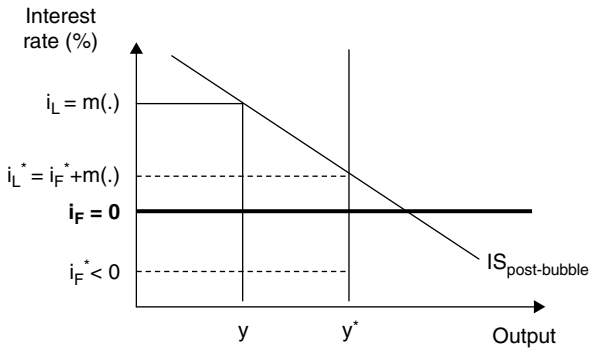

Figure 10.4 The post-bubble trap

imported inflation and lowers living standards by worsening the terms of trade. It may also promote unstable inflation expectations that encourage speculation in land and commodities that are sensitive to interest rates.

Lastly, in addition to the post-bubble interest rate trap, there may also be post-bubble capacity effects. One effect already noted is the potential destruction of manufacturing and tradable goods production capacity during the course of the bubble. A second effect, emphasized by Bernanke (1983), is the potential for destruction of financial capacity when the bubble deflates. Thus, deflation of a bubble combined with ensuing income contraction may trigger bankruptcies, which in turn cause banks and financial intermediaries to fail. This process of destruction of financial sector capacity, combined with the destruction of the creditworthiness of borrowers, may disrupt the normal provision of credit. That can produce an outcome analogous to prolonged credit rationing in which only the only very best and most connected customers get credit. Consequently, both aggregate supply and aggregate demand may contract, leaving the economy stuck far below "normal" potential output.

10.3 Asset bubbles and the policy instrument problem

The above analysis highlights the policy dilemma that asset bubbles pose for policymakers. On one hand monetary authorities need to be able to respond to asset price bubbles – especially in real estate which is debt-financed. However, responding with higher interest rates gives

rise to blunderbuss effects. This points to a need for additional policy instruments to target bubbles.

Such additional instruments can be provided via a system of asset-based reserve requirements (ABRR) such as has been suggested by Palley (2000, 2003a, 2004b). Under a system of ABRR, financial intermediaries hold reserves against their assets. The reserve requirement for each asset category is adjustable and set at the discretion of the monetary authority, and asset categories can be zero-rated. To prevent regulatory arbitrage and avoid unfair competitive distortions, a system of ABRR should be applied to all financial intermediaries. In effect, financial intermediaries should be regulated on the basis of "function" and not "form," thereby ensuring a level playing field for similar businesses regardless of the form firms choose to take.[8]

Given n different asset categories, such a regulatory system creates n – 1 additional policy instruments. The logic is as follows. Let i_j denote the equilibrium interest rate on the jth asset category. Without a system of ABRR the interest rate on this type of asset is

$$i_j = i_F + m_j(.) \tag{11}$$

where $m_j(.)$ = markup required by financial firms for holding assets of type j. Now, suppose assets in the jth category are subject to a per dollar reserve requirement of k_j. In that event, the required interest rate will adjust to

$$i_j = [1 + k_j]i_F + m_j(.) \quad j = 1, \ldots, n \tag{12}$$

The logic is that because financial firms have to hold reserves of k_j they will require a higher return to compensate for the holding cost of those reserves.

More generally, imposing reserve requirements on asset holdings creates a wedge between the interest rate on the asset class and the monetary authority's policy interest rate. The monetary authority can adjust the size of this wedge by varying the reserve requirement, and in doing so can change relative returns across asset classes. That gives it n – 1 extra policy instruments whereby it can change relative interest rates on assets, and thereby influence portfolio and lending allocations.

As with conventional interest rate policy, ABRR work through the interest rate channel. The difference is that conventional interest rate policy raises the general interest rate, thereby affecting all asset classes and sectors simultaneously. That is the source of the blunderbuss collateral damage effect. ABRR avoid this problem by targeting a particular asset

(1) Liabilities → Assets
(LBRR = Reserves on deposits, collateral/margin requirements)

(2) Assets → Liabilities
(Risk based capital standards)

(3) Liabilities → Liabilities
(Debt-to-equity requirements)

(4) Assets → Assets
(ABRR)

Figure 10.5 Comparison of alternative forms of balance sheet regulation

class and raising the interest rate for just that class. Consequently, they provide the benefit of conventional policy without its collateral damage costs.

The comparative logic of ABRR is illustrated in Figure 10.5, which shows the different economic logic embedded in alternative systems of balance sheet regulation. The arrow describes the direction of regulatory linkage. The first system is liability-based reserve requirements (LBRR), which is the conventional way of regulating banking systems. Under LBRR, banks hold reserves (an asset) against deposits (a liability), so that the direction of causation flows from the liability side of the balance sheet (deposits) to the asset side (reserves). When banks take on additional deposit liabilities they must hold additional reserves.

The second form of balance sheet regulation is risk-based capital standards, which is the currently preferred form of regulation. Under this system assets are categorized by riskiness, and banks must hold more equity capital (a balance sheet liability) against more risky assets. Thus, causation runs from the asset side of the balance sheet (risky assets) to the liability side (equity capital). When banks take on additional risky assets they must hold more equity capital.

The third form of balance sheet regulation is debt-to-equity standards. Both debt and equity are balance sheet liabilities, so that causation runs between liability categories. If financial firms take on more debt, they must hold more equity.

The fourth and final form of balance sheet regulation is asset-based reserve requirements. Under this system firms must hold reserves (an asset) against other assets. Thus, if firms expand the assets they hold, they must also increase their reserve holdings. Causation is therefore

contained within the asset side of the balance sheet, and runs from assets to assets.

ABRR have some similarities with margin requirements, and they can therefore be easily misunderstood as equivalent when in reality there are significant differences. One difference is that ABRR are levied against lenders, whereas stock market margin requirements are levied against borrowers who borrow to buy stock. A second key difference is that ABRR are counter-cyclical, whereas margin requirements can be pro-cyclical and create instability. Thus, if asset prices fall, margin requirements generate margin calls that oblige lenders to post additional collateral. That further stresses the system at a time when it is already stressed, and if borrowers are unable to meet the call their holdings may be sold, which further depresses asset prices. In contrast, under a system of ABRR the decline in asset prices will free up reserves because required reserve holdings are based on the market value of the asset. That will loosen monetary conditions as needed.

10.4 Advantages of ABRR

A system of ABRR has numerous advantages. First, ABRR enable the monetary authority to affect the relative cost of different asset categories while holding the policy interest rate constant. That provides monetary authorities with a precision instrument for influencing portfolio and lending allocations. For instance, if a monetary authority wanted to dampen a property bubble, it could impose reserve requirements on new mortgages. That would raise the cost of mortgages without raising the general level of interest rates, thereby targeting the bubble without imposing interest rate blunderbuss effects on the rest of the economy.

Second, as identified by Thurow (1972) and Pollin (1993), ABRR can be used to direct investment finance to neglected socially deserving areas. For instance, if policymakers want to address problems of inner-city decline, they could impose negative reserve requirements on loans made for purposes of inner-city development. In effect, the central bank would subsidize such loans by lending reserves interest free to banks making such socially approved loans.

Third, ABRR have good counter-cyclical properties that render them a form of automatic stabilizer. The reserves held against an asset are calculated on the basis of the asset's value. That means that when asset prices increase, as they do in booms, financial firms need to increase their reserve holdings, thereby exercising a brake on the boom. The reverse holds for economic contractions. Thus, when asset prices fall,

as happened in the mortgage-backed securities market after the financial crash of 2008, this automatically frees up reserves and liquidity. A fourth benefit is the seignorage that accrues to the central bank as a result of financial firms holding non-interest reserves issued by the central bank.

Of particular interest are the relative merits of ABRR compared to risk-based capital standards (RBCS), which is the system of regulation currently advocated by central banks. A first important strength of ABRR is that they promote counter-cyclical adjustment, whereas RBCS are pro-cyclical. In financial downturns ABRR release reserves as asset prices fall, and they increase demand for reserves as asset prices rise. In contrast, RBCS force firms to raise more equity as assets deteriorate in quality, and that can be difficult during downturns. Consequently, RBCS can exacerbate credit crises. A second advantage of ABRR is that it can be used as a tool of discretionary monetary policy since the monetary authority can easily adjust reserve requirements in accordance with market conditions. That gives the monetary authority a tool for targeting particular asset categories that may be subject to asset price bubbles. Additionally, ABRR can serve some of the same functions as RBCS, to the extent that the discretionary reserve requirement takes into account the riskiness of asset classes. Thus, if the monetary authority wants to discourage holdings of a particularly risky asset class, it can raise the reserve requirement on that class. RBCS are less suitable for this type of flexible discretionary policy since it is costly for firms to raise equity capital, and it can be especially costly and difficult to do so in economic downturns and times of financial stress.

A third advantage of ABRR relative to RBCS is that the former confer seignorage benefits, whereas RBCS do not. This seignorage benefit is particularly useful now, after the crisis. Central banks have expanded their balance sheets and increased the supply of reserves. With recovery, some of that liquidity will eventually need to be withdrawn. By increasing the demand for reserves, ABRR can help do that.

Lastly, in principle the two systems of regulation can be combined. Thus, RBCS can be used to discourage excessive risk taking by ensuring that financial firms have "some skin in the game," while ABRR can be used to assist monetary policy and target specific asset market problems.

10.5 ABRR and counter-cyclical capital requirements

Recently, Goodhart and Persaud (2008) have suggested the adoption of counter-cyclical capital standards to combat asset price bubbles. In their scheme, capital standards would rise with asset prices to prevent

overexpansion of financial intermediary balance sheets in booms, and would fall in busts to facilitate continued provision of credit.[9]

Counter-cyclical capital standards have similar objectives to ABRR, and in principle they too can be combined. However, once again there are relative advantages to ABRR. One advantage, noted above, is that ABRR have seignorage benefits because they increase the demand for reserves.

A second advantage concerns the precision of ABRR. A firm that is required to raise more capital will find that its overall cost of capital rises, which will impact all of its activities and not just the activity that is bubble-connected.

A third advantage of ABRR is they can easily be implemented on a discretionary national basis, which is very important because national conditions determine the need for counter-cyclical stabilization policy. Risk-based capital standards have been introduced as a means of governing the global banking system to ensure banks are adequately capitalized. Such regulation is needed because banks are extremely interdependent for their stability, and it is also needed to prevent unfair competition and a regulatory race to the bottom between countries. The fact that capital standards have become the method of international governance of the banking system makes it hard to use them for national counter-cyclical purposes. In effect, counter-cyclical capital standards would place national stabilization policy needs in conflict with international financial governance needs. This problem does not apply to ABRR, because countries can unilaterally lower reserve requirements when the cycle turns down without undermining the agreed-upon system of international financial governance.

Lastly, ABRR have the additional advantage of being a form of reserve requirement, and reserve requirements have a long history of use in financial regulation. They are easy to adjust, their effects are well understood, and both bankers and central bankers are familiar with them.

10.6 Government bonds as the reserve asset?

The reserve asset in a system of ABRR is usually thought to be the liabilities of the central bank. However, another possibility is to allow banks to use government bonds as the reserve asset. This has both advantages and disadvantages.

Bonds are flex-price financial assets whose price adjusts in response to changes in market interest rate conditions. Higher interest rates reduce

the value of bond holdings, and if the value of firms' other assets are unchanged that would require firms to hold additional bonds. The reverse would hold when market interest rates fall.

On the advantage side, this relationship between bond prices and interest rates creates an additional automatic stabilizer. Thus, when an economy starts to boom or when inflation increases, interest rates would tend to rise and bond prices fall. This would automatically cause financial firms to have to allocate resources to buying additional bonds to top up their bond holdings, thereby limiting their financial funds available for other activities.[10]

On the disadvantage side, fluctuations in interest rates would tend to create uncertainty for financial firms. Additionally, to the extent that bond market interest rates move perversely or do not respond to the business cycle, this would limit the automatic stabilizer property.

Finally, with regard to public finances, using government bonds as the reserve asset would increase demand for bonds, which would facilitate budget deficit financing and lower debt servicing costs. Balanced against this, the central bank would lose the seignorage that would come with having its liabilities serve as the reserve asset.

10.7 ABRR and the eurozone

ABRR have particular relevance for the eurozone and the European Central bank (ECB). The establishment of the euro represents an important step in the creation of an integrated European economy. Over time, it should yield dividends as increased competition and lower transaction costs generate increased efficiency. However, member countries have had to give up their own exchange rates and interest rates, and that has created problems for economic management by reducing the number of policy instruments. In particular, the ECB must wrestle with how to set interest rates when some countries are booming while others suffer high unemployment.

ABRR can help fill this policy instrument gap. This is because the ABRR can be implemented on a national basis. For instance, real estate lending, which has been a major concern, is particularly suited to this. Thus, when Spain and Ireland were suffering excessive house price inflation, the Spanish and Irish central banks could have raised reserve requirements on mortgage loans secured by property in those countries. That would have raised Spanish and Irish mortgage loan rates without affecting rates in the rest of Euroland. Conversely, now that Ireland and Spain

are suffering house price deflation, they would be able to lower reserve requirements on mortgages.

Nationally contingent ABRR will create incentives to shop for credit across countries. That means ABRR with a geographically specific dimension will work best when linked to geographically specific assets that cannot escape. This includes mortgage lending that is secured by collateralized property, and shares for which legal title is registered where companies are incorporated. For instance, mortgage loans are secured against specific real property, which determines the jurisdiction in which the loan falls and makes it difficult to escape compliance.

More generally, jurisdictional shopping involves transaction costs. Those transaction costs provide a wedge that allows ABRR to create cross-country interest rate differentials for wide categories of assets. Lastly, jurisdictional shopping would tend to promote cross-country financial integration, which is a long-term goal of the euro project. So even here there is an upside.

One possible problem with a system of ABRR is that it could raise political conflicts between the ECB and member countries. That suggests a two-tier system of ABRR, which would operate at both the Euroland and national levels. Euroland ABRR policy would be controlled by the ECB, and the ECB would have the power to set ABRR across the eurozone with common requirements in all countries. National central banks would have the right to set country-specific asset reserve requirement ratios, subject to the proviso that those requirements be no lower than the requirement ratio set by the ECB. This would give countries the power to set monetary policy that was tighter than that set by the ECB, but not looser. Such a system puts in place a floor to monetary policy that is needed to protect the integrity of the euro, but it gives individual countries the ability to pursue independent tighter monetary policy if deemed necessary.

10.8 Conclusion

In recent years there has been debate over whether monetary policy should target asset price bubbles. That debate has become even more significant in light of the destruction caused by the implosion of the US house price bubble. Both former Federal Reserve Chairman Alan Greenspan and current Federal Reserve Chairman Ben Bernanke are on record as being against targeting bubbles.

This chapter has argued an opposing position. Asset price bubbles can be extremely harmful. That was shown by the earlier deflation of Japan's

real estate bubble, and it is has been shown again with the deflation of the US house price bubble. That said, using interest rates to target bubbles is unsatisfactory because interest rate policy imposes unacceptable collateral damage. Instead, policymakers should adopt a system of ABRR that can provide additional policy instruments that enable targeting asset and credit market excess without raising the general level of interest rates. Not only would such a system provide a means of combating asset price bubbles – it would also provide a means for strengthening standard counter-cyclical monetary policy.

11

Monetary Policy and Central Banking after the Crisis: The Implications of Rethinking Macroeconomic Theory

The financial crisis of 2008 and the Great Recession have prompted a retrospective on the conduct of monetary policy and central banking (Bernanke, 2010). Before the crisis, economists and central bankers were in a celebratory mode, with talk about the "Great Moderation" and praise for advances in monetary economics that had helped stabilize the economy (Bernanke, 2004; Goodfriend, 2007; Blanchard, 2008): now, however, there is talk among policy insiders of need to rethink monetary policy.

The *status quo* "insider" rethink focuses on the role of monetary policy in dealing with asset bubbles; making the central bank the banking system supervisor; and how to deal with the problem of the zero lower bound to nominal interest rates.

This chapter presents an "outsider" reform program that focuses on central bank governance and independence; reshaping the economic philosophy of central banks to be more intellectually open-minded; major monetary policy reform that includes adoption of an inflation target equal to the minimum unemployment rate of inflation (MURI) and implementation of asset-based reserve requirements; and regulatory reform that addresses problems of flawed incentives, excessive leverage, and maturity mismatch.

The proposed outsider reform program is rooted in a rethink of macroeconomic theory compelled by the crisis. There are some overlaps between the insider and outsider reform programs, but they are more form than substance. That is dangerous, because it can confuse debate if similarity of form is mistaken for similarity of substance.

This chapter was first published under the same title in M.H. Wolfson and G. Epstein (eds.), The Handbook of Political Economy of Financial Crises, Oxford University Press, 2013, 624–643.

The insider program makes no changes to macroeconomic theory and is uncritical of the Federal Reserve's past actions; from its perspective, any failings of the Federal Reserve have been unwitting sins of omission. The outsider program, in contrast, fundamentally challenges existing macroeconomic theory and is also highly critical of the Federal Reserve; from its perspective the failings of the Federal Reserve have included significant sins of commission rooted in political capture, cognitive capture and intellectual hubris.

The outsider critique can be taken even further. The Federal Reserve is already legally mandated to pursue maximum employment with price stability. However, it needs institutional transformation that makes it think of itself as an agent for helping realize shared prosperity. That means it should have a duty to shape the allocation of credit and the financial system in ways that ensure growth, full employment and a fair shake for all.

Though the chapter's critique of existing policy and recommended reforms are focused on the US Federal Reserve, the principles that are articulated and many of the proposed reforms carry over to monetary policy and central banking everywhere – including the Bank of England and the European Central Bank.

11.1 Insider rethinking of policy

The starting point for the discussion is the current rethink of monetary policy and central banking among policy insiders. This rethink is reflected in a series of papers by Blinder (2010a, 2010b, 2010c) focusing on three principal areas: monetary policy and asset price bubbles; the role of regulation in monetary policy; and the policy implications of the zero lower bound to the nominal interest rate.

With regard to governance, Blinder (2010a) frames the issue in terms of "central bank independence," which he strongly supports. He is essentially content with the current structure and rejects change, particularly regarding the FOMC and the private corporation status of the twelve district Federal Reserve banks. His argument is that the existing structure has worked well, so why change it now?

With regard to the role of monetary policy in dealing with asset bubbles, Blinder (2010b) frames the issue as whether monetary policy should "lean against" bubbles or "mop up afterwards". The consensus has been mop up afterward. Now, there is an emerging argument for distinguishing between credit-led bubbles and equity-type bubbles in which credit plays only a minor role (Mishkin, 2008; Blinder, 2008), and leaning against credit bubbles and mopping up afterward equity bubbles.

The new approach to bubbles in turn motivates new thinking about regulatory supervision. Blinder (2010b) defends a generic tendency to caution about bubble activism on grounds that central banks have no information advantage, and they also lack targeted instruments so that costs of collateral damage from intervention may outweigh benefits. However, central banks might have the information and instruments to deal with bank-based credit bubbles if they are also the banking system supervisor. That argument therefore recommends making the central bank the banking system supervisor, and the argument is further supported by adding a third goal for monetary policy of financial stability (in addition to the existing goals of low inflation and high employment).

The third issue is the zero lower bound (ZLB) to nominal interest rates that limits the Federal Reserve's ability to lower interest rates. In a presentation at the FRB Boston conference of October 16, 2010, Blinder (2010c) argues for more safeguards against bumping up against the ZLB. Principal among these is a higher inflation target, a policy proposal that has also been floated by IMF Chief Economist Olivier Blanchard and his co-authors (2010).

11.2 The outsider case for more profound reform

The Blinder (2010a, 2010b, 2010c, 2008)–Mishkin (2008)–Blanchard et al. (2010) proposals represent the "insider" program for reform of monetary policy and central banking. Blinder is a former vice-president of the Federal Reserve; Mishkin is a former governor of the Federal Reserve; Blanchard is chief economist at the IMF; and all three are leading academic economists holding positions at Princeton, Columbia, and MIT respectively. Their proposals leave both the institutional structures of central banking (the Federal Reserve) and the theory justifying policy essentially unchanged.[1]

This insider program can be contrasted with an outsider program that argues for more substantive reform. The starting point is the recognition that central banks are critically important institutions in today's system of financial capitalism. Without the Federal Reserve, the US government would have been unable to stop the financial crisis of 2008. And without it, the US government would likely now be having considerable difficulty financing its huge budget deficit.

Central banks' power is rooted in their ability to issue money and set interest rates. This is a constructive and vital power, which means the Federal Reserve must be part of the policy solution. But it is also a power that can be abused, which means that the Federal Reserve can be part of the problem. The challenge is to see that the central bank's powers are

deployed properly on behalf of the public interest; are not abused via arbitrary or excessive use; and that others cannot force the central bank to use its powers on their behalf.

Right now that is not the case. The Federal Reserve failed to properly deploy its powers, as evidenced by the policy failures that led up to the crisis. Its powers are also too much in the service of financial market interests, in part to save the economy from their destructive speculative activities. The clearest evidence of this is the new concern about the "too big to fail (TBTF)" problem whereby mega banks are too big to fail and are therefore subsidized in credit markets because lenders know the central bank will not let big banks fail for fear of the collateral damage that failure will inflict. The TBTF problem surfaced during the crisis, but a similar problem has been evident for a while in the form of the "Greenspan put" that protected the stock market against declines, again for fear of collateral macroeconomic damage.[2]

An outsider reform program involves four parts, as illustrated in Figure 11.1. Those parts are: governance reform; change of economic philosophy; monetary policy reform; and regulatory reform. This outsider framing of the reform question is substantially different from the insider framing in two critical respects. First, insider reformers frame the problem of how to improve the Fed's performance within the exiting institutional and theoretical frame. There is no mention or indication of the possibility that the Federal Reserve may have contributed to the making of the crisis. For insiders there have been no sins of commission on the part of the Federal Reserve, only unwitting sins of omission.

Second, insider reformers see no problem regarding political capture of the Federal Reserve by financial market interests. The theory of regulatory capture, whereby regulated interests capture their regulators, is well known among economists. However, from an insider perspective the theory is germane to other agencies but not the Federal Reserve, which explains the uncritical discussion about central bank independence (about which more below).

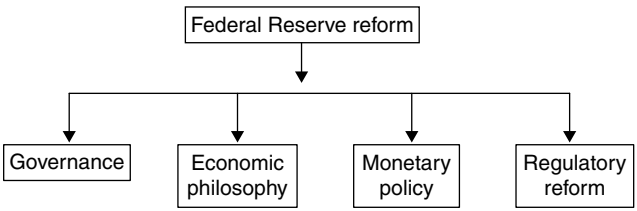

Figure 11.1 A program to reform the Federal Reserve

11.2.1 Governance and central bank independence

The financial crisis and the subsequent government rescues of banking systems has led to a rediscovery of political economy and its relevance for understanding monetary policy, regulatory policy, and the Federal Reserve. The argument is that in the 1990s and 2000s financial interests were able to capture the regulatory system and use this capture to their advantage, pushing unsound deregulation and blocking needed regulation. That capture was evident in the financial deregulation and lack of re-regulation that characterized the period 1980 to 2008. The Glass–Steagall Act (1933), an iconic piece of New Deal legislation that barred firms from undertaking both investment and commercial banking activities and barred banks from owning insurance companies, was repealed in 1999. Citigroup went so far as to complete its purchase of Travelers Insurance a year in advance of Glass–Steagall's repeal.

Another example of capture is from 1998, when Treasury Secretary Robert Rubin and Federal Reserve Chairman Alan Greenspan successfully blocked attempts by Brooksley Born, head of the Commodity Futures Trading Commission, to regulate the derivatives market. The Commodities Futures Modernization Act of 2000 exempted derivatives from regulation and allowed them to be traded almost entirely free of regulation in so-called "over-the-counter" markets.

A third example concerns the Securities Exchange Commission. In 2004, the Securities Exchange Commission passed its net capital exemption rule that reduced the amount of capital Wall Street's largest brokerage houses had to hold, and it also allowed investment banks to adopt self-regulation with regard to assessing the value of their capital at risk. An immediate consequence of the rule was a surge in investment bank leverage, and debt–equity ratios rose from around 15:1 in 2004 to over 30:1 by 2008.

This process of regulatory and political capture is documented by Johnson and Kwak (2010) in their best seller, *13 Bankers: The Wall Street Takeover and the Next Financial Meltdown*. Their thesis is that bankers remain firmly in control of the political-regulatory process and have successfully blocked the needed post-crisis reform and regulation.

The traditional focus of capture theory is microeconomic regulation. However, the logic of capture theory also applies to macroeconomic policy, something that is entirely missing from the little mainstream discussion about capture. Macroeconomic policy capture is particularly important for monetary policy and central banking, as it can affect the relative policy emphasis given to inflation versus unemployment. It will also affect the willingness to use regulatory tools (balance sheet

restrictions, margin requirements, and reserve requirements) for purposes of enhancing macroeconomic policy. That is particularly germane to the issue of asset price bubbles and their macroeconomic impacts.

Epstein (1992) distinguishes between financial capital, industrial capital, and labor. Palley (1996b (1997)) argues that financial capital is likely to have a strong preference for low inflation to protect financial wealth; industrial capital will have a preference for a stronger real economy and lower unemployment to boost demand and profits; and workers will want full employment to boost real wages. In that case, if financial interests dominate the Federal Reserve it will tend to produce macroeconomic outcomes characterized by higher unemployment and lower inflation (that is, a point further down the Phillips curve).

The issue of policy preferences is also germane to the question of central bank independence. Insider economists argue that central bank independence is a mechanism for helping address politicians' incentive to push inflation too high. For instance, using a game-theoretic natural rate of unemployment model, Barro and Gordon (1983) show that policymakers will push inflation too high in an attempt to secure temporary real output gains. There are three features to note. First, the model assumes a vertical Phillips curve that offers only temporary output gains. Second, even those gains come from "fooling" private sector agents into making sub-optimal supply decisions. Third, the public is assumed to have a unified set of preferences that differ from politicians' preferences, and it is this that causes politicians to impose sub-optimal outcomes on the public. Thus, politicians are effectively represented as the enemy of the public.

For insider economists, central bank independence is viewed as a means of solving this preference conflict issue. The problem is that the assumptions are false, and central bank independence does not solve the preference conflict. The reality is that the public's preferences are divided according to economic interests. Consequently, central bank independence may simply entrench one set of interests – probably those of financial capital.

Palley (1996 (1997)) shows that in a model like that of Barro and Gordon (1983) a financially dominated central bank will choose sub-optimally low inflation. If the economy has a negatively sloped long-run Phillips curve, that causes permanent output losses and permanently higher unemployment.

In a sense, the frame of central bank independence is wrong. Instead, the frame should be establishing institutions that deliver best outcomes within the context of constitutional democracy. That is an enormously difficult challenge, which mainstream economists evade *de facto* via

two assumptions. First, they assume the public's preferences are unified. Second, they assume they have the "true" model of the economy, as described by the theory of the natural rate of unemployment. These assumptions remove conflict about policy goals and conflict about how the economy works and what is economically feasible.

Neither of these two assumptions is true. The public's preferences are clearly divided, as evidenced by contested politics. Second, there are lots of views about how the economy works, of which the mainstream view is but one – albeit a view that dominates economics, because mainstream economists suppress alternative views by denying them space. These considerations mean that poorly designed central bank independence may worsen the real world policy problem by giving dominance to particular interests. For instance, by entrenching financial interests it may lead to sub-optimal inflation–unemployment outcomes. Furthermore, it may also cause political damage by undermining principles of constitutional democracy.

That said, there may still be a place for central bank independence as a means of restraining populist political pressures on monetary policy. However, any independence must always be granted subject to self-conscious awareness of the problem of conflicting preferences, and the problem of conflicting views about the economy, and with absolute deference to constitutional democracy. That means central banks must be accountable to elected officials, fully represent competing interests, and avoid political and intellectual capture.

With regard to the Federal Reserve, this suggests the following institutional reforms.

Reform #1: nationalize the Federal Reserve System so that it is fully owned by the federal government. The presidents of the district Federal Reserve Banks are currently appointed by the boards of directors of those banks, which are 50 per cent owned by private member banks. These district banks should be nationalized and their presidents appointed by the US President subject to Senate confirmation. The rationale is to diminish the possibility for private influence within the system.

Reform #2: change the Federal Reserve appointment structure so that every four years the incoming President gets to appoint the Federal Reserve Chairman subject to Senate confirmation. The rationale is that voters hold the President responsible for the economy and the President should therefore have full opportunity to pursue his policy. This would strengthen democratic accountability of the Federal Reserve.

Reform #3: the Federal Reserve should issue an annual social report that explicitly addresses the question of institutional capture. The report would

be presented to Congress and would address the social, commercial and political backgrounds of appointees and senior management with an eye to ensuring wide representation of points of view. The very requirement of a report would constitute public acknowledgement of the potential for capture, and the report itself would be a focal point for annually considering the problem.

Reform #4: rationalize the Federal Reserve System and reduce the number of district banks to four (New York plus three) plus the Board of Governors. The rationale is that the existing structure of twelve district banks is costly and outdated, reflecting the railroad economy of the 19th century. The current time of budget austerity provides an opportune and justified moment to prune and modernize the Federal Reserve System.

11.2.2 Economic philosophy reform

The financial crisis revealed a catastrophic failure of thought at the Federal Reserve. Despite employing hundreds of economists, the entire Federal Reserve System was taken aback by the crisis; failed to understand it as it was happening; and has been repeatedly surprised by the depth and duration of the Great Recession.

One explanation is that the Federal Reserve System succumbed to "group think" which was also part of a larger group think in the economics profession. That group think pushed an "intellectual cleansing" of all who disagreed with the new economic consensus.

It also created the conditions for the "black swan" event that blindsided the Federal Reserve. Black swan events are not a statistical phenomenon concerning low probability distant tail outcomes. Instead, they are a sociological phenomenon produced by closed mindedness, and the Federal Reserve was blinded to the reality of economic developments by its group think among its economists and policymakers.

Viewed in this light, the Federal Reserve's failure reflects a lack of pluralism rooted in a fundamentally wrong-headed beliefs that it has access to truth and that its model is the true model. As the philosopher Karl Popper (1959) showed, that is epistemologically impossible. The best that is possible is to have a model that is not rejected by the facts. However, because of the coarseness of tests in economics, that means having to live with several theories and models.

It can be argued that the Federal Reserve's intellectual failure is the root cause of its policy failure, and Buiter (2008b) argues the Federal Reserve was subject to cognitive capture. Buiter represents this phenomenon as a purely intellectual failure, but the ideas that dominated policy supported the interests of finance. Viewed in that light, cognitive capture

is simply the intellectual extension of conventional regulatory capture. That speaks to a need for reform that protects against future intellectual failure.

Reform #5: the Federal Reserve should be legally mandated to promote a pluralistic open-minded approach to economics and economic policy that self-consciously avoids the pitfalls of ideology and group think. There is value in Congress debating intellectual pluralism and passing legislation both to provide instruction to the Federal Reserve and to change its intellectual frame, as happened with The Employment Act of 1946. As a first step in this direction, the Federal Reserve should commission an investigation into its failure to foresee the crisis and its failed predictions about recovery.[3] Delivering on such a law requires ultimately having the right people in charge, which is why personnel change at the Federal Reserve is so important – but the first step is mandating action.

An example of the type of thinking that must be incorporated into the Federal Reserve System is Hyman Minsky's (1992 (1993)) "Financial Instability Hypothesis." The crisis has boosted Minsky's standing, and economists are making increased mention of him. However, that mention is token and the fundamental analytical framework remains unchanged. From a Minsky perspective "success breeds excess breeds failure," and finance has a genetic proclivity to instability. Palley (2009a (2011)) argues that a Minskian perspective implies the following policy propositions:

Policy proposition #1: policymakers must exercise self-conscious skepticism toward euphoria (that is, no more policymaker chatter of "Great Moderations" and "New Economies").

Policy proposition #2: capitalist economies always need significant regulation to contain financial speculation and financial excess. Milton Friedman is the philosophical advocate of a deregulated economy, and the justification is provided by the first welfare theorem of competitive general equilibrium theory. In contrast, Hyman Minsky is the philosophical advocate of a regulated economy, and the justification is provided by his financial instability hypothesis. That is fundamentally different from, though also compatible with, the conventional market failure justification for regulation which is rooted in competitive general equilibrium theory. The policy implication is that it undoes the presumption that regulation is guilty until proven innocent; instead, some form of regulation is always needed.

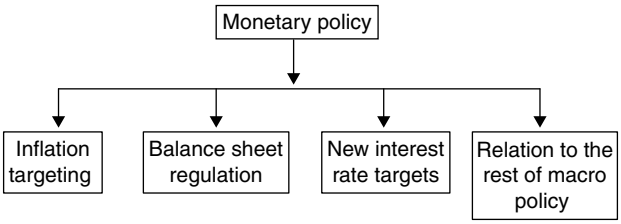

Figure 11.2 Monetary policy reform

Policy proposition #3: Discretion dominates rules. Models, numbers and rules are always insufficient for policymaking, and there is always need for judgment because the economy is subject to an evolutionary dynamic that cannot be foreseen. That said, policy should still aim to be credible and clear. As Keynes [1936] emphasized, uncertainty is costly in market economies. It can paralyze economic action and it can also induce costly defensive actions. Policymakers should therefore look to reduce policy-induced uncertainty by ensuring that policy is credible and clear. This is a valuable policy lesson provided by new classical macroeconomics, and it is one that carries over to Keynesian and Minskian macroeconomics.

11.2.3 Monetary policy reform[4]

A third area of reform is the conduct of monetary policy, and here rethinking of macroeconomics prompts four reforms, as illustrated in Figure 11.2.

Reform #6: Central banks should target inflation so as to hit the minimum sustainable rate of unemployment. The Phillips curve (the trade-off between inflation and unemployment) is backward bending, and central banks should aim for the inflation rate that minimizes the unemployment rate. In the USA that rate of inflation is probably between 3 and 5 per cent, and it can be termed the minimum unemployment rate of inflation, MURI (an acronym that can be contrasted with Milton Friedman's NAIRU). The backward bending Phillips curve and the MURI are illustrated in Figure 11.3.

Blanchard et al. (2010) and Blinder (2010c) have both also suggested raising the inflation target, but their reasoning is to push up nominal interest rates to avoid getting caught in the zero lower bound trap. That reasoning leaves unchallenged the theory of a natural rate of unemployment and its claim of a vertical Phillips curve. It also implies sticking with the flexible labor market agenda that is the implicit policy

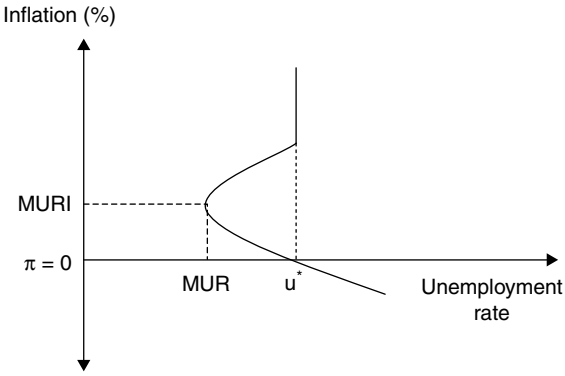

Figure 11.3 The backward bending Phillips curve

recommendation of Friedman's natural rate theory, and that agenda has contributed significantly to the worsening of income distribution.

According to that theory, the natural rate of unemployment is determined by labor market frictions, including unions, high minimum wages, fringe benefits that raise labor costs, and employee protections. If policymakers want to bring down the natural rate, they should eliminate these features. The Blanchard–Blinder insider justification for a higher inflation target sticks with this thinking.

It is therefore very important to get the right justification for a higher inflation target. The theory of the backward bending Phillips curve provides a justification, but here too it is important to get the right theory. Justifications for a backward bending Phillips curve have been provided by both Akerlof et al. (2000) and Palley (2003b). Akerlof et al. (2000) identify near-rational expectations and the process of expectation formation as the cause of the backward bend. They argue that as inflation increases agents expectations become fully rational, causing the Phillips curve to bend backward. Palley (2003b) identifies incomplete incorporation of inflation expectations into nominal wage settlements as the cause of the backward bend. The argument is that workers in sectors with unemployment are willing to accept some modest real wage reduction via inflation so long as this is at low rates of inflation. However, they resist too rapid reductions by too high inflation, and this resistance causes the Phillips curve to bend backward once inflation passes a critical threshold.

As argued in Palley (2009c, 2011), there is an important distinction between these two approaches. The Akerlof et al. (2000) approach generates a Phillips trade-off by fooling workers into misperceiving

inflation at low rates. It therefore lacks an economic welfare justification for non-zero inflation. The Palley (2003b) approach emphasizes the role of inflation in greasing the wheels of wage adjustment in labor markets. It therefore has a welfare justification for non-zero inflation.

Furthermore, the extent of incorporation of inflation expectations into wage settlements reflects conditions of job market security and labor militancy. These conditions can change, in which case the backward bending Phillips curve will shift and the MURI will shift. Policy that fails to change in response to such shifts will be sub-optimal, but policymakers need the right theory if they are to recognize and respond to shifts. The bottom line is that it is important to have the right economic theory to arrive at the right policies and provide them with appropriate reasoning and justification.

Lastly, the rationale for targeting inflation should be absolutely clear. Here, the old distinction (Friedman, 1975) between "intermediate" and "ultimate" targets can help. Inflation is both an intermediate and ultimate target. It is an ultimate target because inflation has costs, and it is an intermediate target because it helps reach the other ultimate target, which is the unemployment rate. Given these dual targets, it is critical that inflation targeting (including MURI targeting) be lodged in a policy framework that explicitly states that the monetary authority has a responsibility for real economic performance. Absent that, it is easy for policy to slip into thinking inflation is the only ultimate target. Once that happens, the natural tendency is to push for a lower inflation target so that policy ends up producing sub-optimal outcomes with regard to the real economy.

Reform #7: central banks should adopt a system of asset-based reserve requirements that enables targeted discretionary counter-cyclical balance sheet controls on the financial sector. This system should apply to shadow banks and hedge funds. A central lesson of the financial crisis and the last decade is that monetary authorities cannot manage the economy with just interest rates and an inflation target. Doing so leaves the economy exposed to build-ups of financial excess. These build-ups do not necessarily cause inflation, and therefore fly under the radar screen of an inflation-targeting regime. However, they generate financial fragility that can undermine the economy, and also leave a large "debt" footprint that retards economic activity and is difficult to escape.

That suggests inflation targeting should be supplemented by quantitative balance sheet controls that limit such build-ups. As argued in Chapter 10, one such system of control that is both general and flexible is asset-based reserve requirements (ABRR) that extend margin

requirements to a wide array of assets held by financial institutions. Financial firms have to hold reserves against different classes of assets, and the regulatory authority sets adjustable reserve requirements on the basis of its concerns with each asset class.

ABRR provide a new set of policy instruments that can target specific financial market excess, leaving interest rate policy free to manage the overall macroeconomic situation. They can also help prevent asset bubbles by targeting overheated asset categories, and they are particularly good for targeting house price bubbles since they can target the issue of new mortgages. By requiring financial firms to retain some of their funds as non-interest-bearing deposits with the central bank, policymakers can affect relative returns on different categories of financial assets.[5] If policymakers want to deflate a particular asset category, they can impose higher reserve requirements on that category, thereby reducing its returns and prompting financial investors and firms to shift funds out of that asset into other relatively more profitable asset categories.

ABRR also increase the efficacy of monetary policy, especially by enabling central banks to target sector imbalances without recourse to the blunderbuss of interest rate increases. If a monetary authority is concerned about a particular type of asset bubble generating excessive risk exposure, it can impose reserve requirements on that specific asset without damaging the rest of the economy. Furthermore, an ABRR system also acts as an automatic stabilizer. When asset values rise or when the financial sector creates new assets, ABRR generate an automatic monetary restraint by requiring that the financial sector hold more reserves.

Another benefit is they provide a policy tool that can encourage public purpose investments such as inner-city revitalization or environmental protection by setting low (or no) reserve requirements on such investments (Thurow, 1972; Pollin, 1993).

ABRR increase the demand for reserves which will allow the Fed to exit the current period of quantitative easing and avoid future inflation. In a sense, they provide an alternative to the quantitative easing exit strategy proposed by Chairman Bernanke that involves paying interest on reserves. The latter is costly to government, and it effectively rewards banks for the crisis they caused, since they now gain a new revenue stream (Palley, 2010b). In contrast, ABRR increase seignorage revenue for governments at a time of fiscal squeeze.

ABRR work best when applied uniformly to all financial firms and when linked to geographically specific assets that cannot evade the regulatory net. They are also consistent with the application of other balance

sheet controls. For instance, they are a form of liquidity requirement, only they require that liquidity be held against a specified asset class.

They are also consistent with capital standards that aim to discourage excessive risk taking. However, capital requirements can be destabilizing because they are pro-cyclical (capital is eroded in recessions, therefore potentially forcing lending cutbacks that amplify the downturn). Capital standards are also less flexible in the sense of being more difficult to adjust, as firms need time to raise capital.

ABRR can also stabilize exchange rates. For instance, a country suffering undesirable exchange rate depreciation could impose ABRR requirements on foreign currency deposits of domestic financial institutions. That can complement Chilean style reserve requirements, designed to fight undesirable currency appreciation by imposing unremunerated reserve requirements on capital inflows.

Lastly, ABRR can help members of currency unions (for example, countries using the euro) to fill the policy instrument gap that arises from giving up their domestic currency and ability to determine local interest rates. Since ABRR can be implemented on a geographic basis by national central banks, domestic policy can be better set in accordance with the local conditions.

Philosophically, there is a significant difference between ABRR and insider chatter surrounding the possible need to deal with asset price bubbles. An ABRR system is designed to be part of normal, standard, everyday operation of monetary control, and it is consistent with a Minsky's financial instability hypothesis that emphasizes tendencies to instability. Just as interest rate control is an ordinary policy measure, so too should be quantitative balance sheet controls. That ABRR are good at targeting asset price bubbles is a supplementary benefit. This contrasts with insider thinking, which appears to frame the issue of balance sheet controls in terms of special and unusual circumstances of asset price bubbles rather than everyday management of the financial system. When it comes to everyday management of the economy, the insider perspective is still stuck on interest rate control. This is reflected in the Federal Reserve's new focus on payment of interest on reserves that is designed to strengthen the Fed's control of short-term interest rate, but there is still nothing about quantitative measures aimed at controlling credit and financial asset creation.

Reform #8: target more than just the overnight interest rate. Over the past three decades, monetary authorities have used interest rate policy to target the overnight rate. In the USA this rate is the federal funds rate. In the Eurozone it is the European Central Bank's Lombard rate. There are

both narrow technical reasons and broader reasons of macroeconomic theory for targeting additional interest rates.

To the extent that policy aims to affect long-term rates, current policy does so by shifting the entire term structure of interest rates up or down. It may also affect the term structure of interest rates via the expectations of future short-term rates. Thus, according to the expectations theory of the term structure, the current two-period interest rate is the product of the current short-term rate and the current expected period 2 short-term rate. This can be expressed as follows

$$i_{2,t} = [1 + i_{1,t}][1 + E_t[i_{1,t+1}]] - 1 \quad (1)$$

$i_{2,t}$ = current two-period rate, $i_{1,t}$ = current one-period rate and, $E_t[i_{1,t+1}]$ = current expectation of the next period short rate. The term structure and longer-period rates are therefore managed indirectly by affecting expectations of future short-period rates.

This indirect management is weak and rests on markets having the correct expectations about future period short rates. Yet despite this weakness, monetary authorities have until recently resisted targeting longer-term rates. The reasoning for this is not clear, but it seems to be related to some belief that they cannot do so.

The Federal Reserve's policy of quantitative easing (QE) adopted after the crisis has shattered that fiction. It is now clear that monetary authorities can target longer-term rates, and they should do so. Moreover, not only should they target longer-term government bond rates with an eye to managing the risk-free term structure, but they should also target some private sector interest rates. In particular, the Federal Reserve should consider targeting mortgage-backed security (MBS) interest rates because mortgage rates are so critical for the economy. One reason for targeting these rates is if the central bank feels the spread between MBS rates and government bond rates is inappropriate, suggesting the mortgage market is malfunctioning. A second reason is if the housing market is weak and threatens the economy, in which case intervention that lowers MBS rates can be a form of stabilization policy.

More generally, a Keynesian approach to monetary policy would justify going far beyond targeting just the overnight interest rate. A central message of Keynes' *General Theory* is that financial markets do not set interest rates (of which there are many) in a manner that ensures full employment. That is the Keynesian macroeconomic justification for interest rate-based monetary policy, but there is no reason to restrict policy to targeting just the overnight rate.

Reform #9: use the bully pulpit to speak out on behalf of better overall economic policy. Blinder (2010a) also recommends using the bully pulpit, and he proposes enlisting it as an anti-bubble weapon. What he terms "howling and scowling" can discourage speculative behaviors by banks. Such use of the bully pulpit is entirely appropriate. However, the insider take on the issue again casts it narrowly and as if the Federal Reserve's failure to use the bully pulpit was exclusively a sin of omission.

The reality is that the Federal Reserve has used the bully pulpit, but has used it asymmetrically. Chairmen Greenspan and Bernanke have in the past talked about the benefits of globalization; the need for budget austerity; the case for tax cuts, the case for social security cuts, and the damage done by the minimum wage. This is a one-sided use of the bully pulpit that reflects the dominance of a particular economic ideology at the Federal Reserve.

That speaks to the need for intellectual balance, which in turn speaks for appointing some progressive Federal Reserve governors and district bank presidents who will use the bully pulpit to advocate a different economic agenda. The rationale for such an agenda is that it would stabilize the economy, increase growth, and help the Fed meet its mandate.

For instance, the bully pulpit could be, and should have been, used to talk about the macroeconomic problems that come from worsening income distribution. It should also have been used to talk about the exchange rate, how an overvalued dollar makes the Fed's job more difficult, and how exchange rate manipulation by trade rivals can harm the American economy.

11.2.4 Regulatory reform

The final set of reforms concerns regulation. This is an enormous area and impossible to cover in detail, but the architecture of needed reform can be easily understood. Regulatory reform overlaps with the ABRR piece of monetary policy reform, revealing how ABRR play two roles: first as part of monetary policy that manages the level of economic activity, and second as part of the regulatory system that ensures financial stability.

The financial crisis revealed unambiguously that the financial system is currently unstable. That means that regulatory reform is needed. Figure 11.4 identifies the three major causes of the financial crisis. The first was flawed incentives that promoted loan pushing and unsound lending. This was particularly true of mortgage lending and mortgage related products. The second was excessive leverage that created balance sheet vulnerability to small losses that wiped out equity, which in turn undermined willingness to lend to weakened financial firms. Excessive

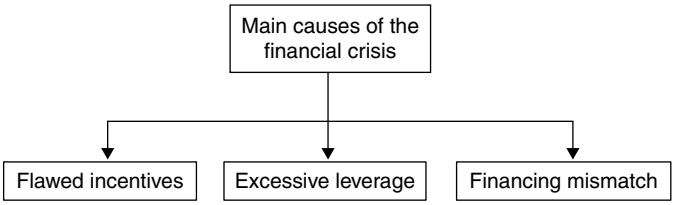

Figure 11.4 Main causes of the financial crisis

leverage was particularly extreme among Wall Street investment banks. The third was maturity mismatch whereby long-term assets were funded with short-term liabilities. This exposed the system to the equivalent of a bank run when the commercial paper (CP) market froze and lenders were unwilling to rollover CP market loans. This problem was particularly acute among shadow banks and Wall Street investment banks. The combination of all three factors created a disastrously fragile system. Flawed incentives produced toxic loans that caused equity losses that wiped out equity owing to high leverage. That meant that lenders were unwilling to roll over CP market loans, which triggered insolvency and started a downward liquidation spiral that worsened equity losses and further reduced willingness to roll over CP loans.

These structural failings can be significantly addressed by the following ten-point plan (some parts of which have been implemented in the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010):

(1) Financial market regulation should be comprehensive, covering all financial institutions on the basis of function (what they do) rather than form (what they call themselves). This would create a level playing field in which the shadow banking system, Wall Street investment banks, and the structured investment vehicles (SIVs) of commercial banks would all be subject to regulation. Regulatory avoidance should not be tolerated as a means of gaining business competitive advantage.
(2) To remedy incentives to loan push, lenders should be required to hold a "stub" ownership interest in all loans they originate. This would leave lenders exposed to future loan losses, thereby diminishing the "loan pushing" incentive that comes with the "originate to distribute" lending model which has lenders selling loans they make in the secondary market.
(3) Additionally, a significant share of top management bonus pay should be in the form of long-dated stock options. This would

also help remedy the "originate to distribute" model's incentive to loan push because managers would bear some of the costs if loans subsequently went bad.

(4) To remedy the excessive leverage problem, financial firms should be subject to strict leverage limits based on sharply higher equity capital requirements. This would help diminish insolvency risk by giving banks the capacity to withstand losses.

(5) To remedy the problem of bank runs such as occurred in the CP market, lenders should be subject to reasonable liquidity requirements.

(6) It should be illegal for investors to purchase credit default swap (CDS) insurance coverage on bonds they do not own. This would help prevent assassination of companies' credit standings by speculators hoping to profit from a bankruptcy by selling CDS and thereby sending false signals about a company's financial health.

(7) The credit default swap market should be regulated, and all CDS transactions should pass through market clearing arrangements. This would help prevent a repeat of the AIG situation in which the market was unaware of the extent of risk taken on by AIG through purchase of CDS.

(8) To reduce the maturity mismatch problem, financial companies should be required to issue contingent convertible bonds (COCOs) as part of their capital structure. Such bonds automatically convert into equity when existing equity is eroded beyond a threshold by losses. The price of these bonds would also act as a "canary in the coal mine" by signaling in advance the riskiness of companies.

(9) As discussed earlier, monetary authorities should introduce a system of ABRR that supplements and reinforces interest rate policy. ABRR can be useful for both macroeconomic stabilization and stabilizing the financial system.

(10) There is need for political reform that limits political contributions from financial firms. Those contributions buy political influence, and they helped drive the policies of flawed deregulation and light touch regulation of the past 30 years. That influence is also now blocking re-regulation (Johnson and Kwak, 2010).

11.3 Conclusion: political economy and the difficulty of change

The financial crisis and Great Recession have prompted a rethink of monetary policy and central banking among insider policymakers. The

impulse to rethink is welcome, but it can also mislead because the suggested changes are small relative to the scale of monetary policy failure. In all important respects, the insider approach to reform leaves essentially unchanged both the theoretical paradigm guiding monetary policy and the thinking about the institutional structures of central banking.

This lack of deep change reflects the entrenched nature of thinking that surrounds monetary policy and central banking, which in turn can be viewed as part of a larger political economy that blocks change. Politicians are disinterested in pushing for change because monetary policy and regulatory policy raise technical issues that have little resonance with the public. Voters do not lobby Congress about the Federal Reserve, and nor do they decide how to vote on the basis of Federal Reserve policy, despite its critical impact on their lives.

The Federal Reserve is also protected by Wall Street and the banking and financial community whose interests it often identifies with. That is because of institutional capture, a tendency to a shared intellectual outlook among those working in finance and banking, and a revolving employment door between Wall Street and the Federal Reserve. Lastly, the Federal Reserve is also protected by its patronage of academia, which includes its own revolving door with university economics departments. That buys the Federal Reserve intellectual cover and legitimacy.

These political and sociological structures make it very difficult to change monetary policy and central banking, but the scale of the policy failure in connection with the financial crisis creates an historic opportunity. Not only should change alter technical policy – it should aim to transform the identity of the Federal Reserve. The Employment Act of 1946 and the Full Employment and Balanced Growth Act of 1978 charged the Federal government with securing maximum employment with price stability. However, since the appointment of Paul Volcker as Federal Reserve Chairman in 1979, the Federal Reserve has retreated from these obligations. From an outsider perspective, not only does the Federal Reserve need to recover a commitment to full employment, it needs a transformation that makes it think of itself as an agent that helps realize a shared prosperity vision of society. Not only is it entrusted with monetary policy and regulatory responsibilities; it should have a duty to shape the allocation of credit and the financial system in ways that ensure growth, full employment and a fair shake for all.

12
The Political Economy of Financialization

Financialization constitutes a particular ordering of economic arrangements. That statement challenges the way economists usually talk about the economy, because it challenges the view that the economy is a natural order.

The perspective in this book is that the economy is made, not found. By that is meant that economies are shaped by choices societies make about laws, institutions, and economic policies. Such a perspective inevitably takes the analysis into the realm of political economy. Fully understanding financialization is no longer just a matter of formal macroeconomic analysis, but also involves understanding the political and sociological dynamics that explain those societal choices. As shown in Chapter 11, this significance of political economy is clear with regard to the Federal Reserve and its conduct of monetary and regulatory policy.

Figure 12.1 illustrates the political economy triangle, which shows how the economy, ideas, and politics and economic policy interact to impact each other. The economic structure determines economic outcomes, including the distribution of economic power, wealth, and income. That enables the economic winners to influence politics, economic policy, and ideas. The control of politics and policy influences the structure of the economy, and it also influences ideas by privileging some and

This chapter draws heavily on my paper "Macroeconomics after the bust: the outlook for economics and economic policy," which was presented at a conference sponsored by the Institute for Macroeconomics of the Hans Böckler Stiftung, held in Berlin, Germany, 31 October–1 November, 2008. The paper was subsequently published in Hein, Van Treeck, and Truger (eds), Macroeconomic Policies on Shaky Foundations: Whither Mainstream Economics? Metropolis–Verlag, Marburg: Germany (2009), pp. 371–91.

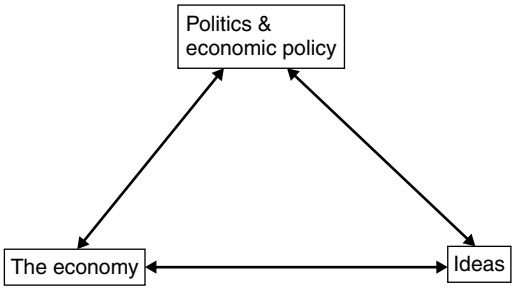

Figure 12.1 The political economy triangle

suppressing others. Ideas in turn infuse politics and economic policy, and they influence the economy and economic outcomes by impacting behaviors, laws, and choice of institutional arrangements. Financialization can only be fully understood by recognizing the significance of the triangle.

12.1 Economic policy and financialization

Chapter 2 described the main economic developments in the era of financialization – including the increased relative size of the financial sector; the increased reliance on debt finance; the shift in the distribution of income toward profit and interest; and increased income inequality, with the bulk of income gains accruing to upper-echelon households.

Analytically, the key feature of the era has been severing of the link between real wage and productivity growth. This severing coincided with the inauguration of a new growth model. In the pre-financialization era, before 1980, wages drove demand growth. After 1980, however, demand growth was driven increasingly by asset price inflation and borrowing.

The pre-financialization growth model can be described in terms of a Keynesian virtuous circle, as shown in Figure 12.2. Wage growth drove demand growth, which promoted full employment. That in turn encouraged investment, which drove productivity growth, which in turn drove wage growth. The key features of the model were full employment and a tight link between wage and productivity growth, both of which features have been abandoned in the era of financialization.

Economic policy played a key role in overthrowing the Keynesian virtuous circle growth model, and the new policy paradigm can be described as a neoliberal box, which is illustrated in Figure 12.3. Workers are boxed in on all sides by a policy matrix consisting of globalization, labor market

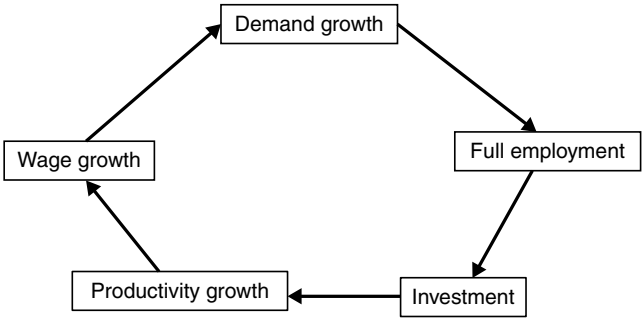

Figure 12.2 The Keynesian era virtuous circle growth model

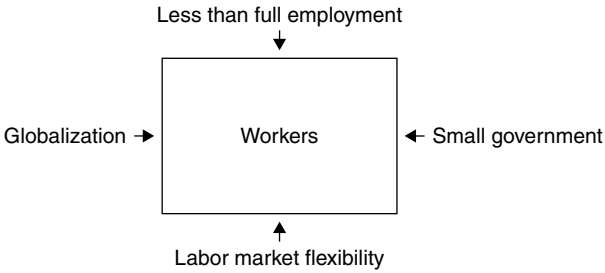

Figure 12.3 The neoliberal policy box

flexibility, replacement of concern with full employment by concern with inflation, and an attack on regulation and government provision of economic services, public goods, and economic security.

Corporate globalization puts workers in international competition via global production networks supported by free trade agreements and capital mobility. The labor market flexibility agenda attacks both unions and labor market supports such as the minimum wage, unemployment benefits, and employment protections. The abandonment of full employment creates employment insecurity and weakens worker bargaining power. Finally, the "small" government agenda attacks the legitimacy of government and pushes for deregulation regardless of dangers.

This model was also implemented on a global basis, in both North and South, which multiplied its impact. That explains the significance of the Washington Consensus in the 1980s and 1990s, which was enforced in Latin America, Africa, and former Communist countries by the International Monetary Fund and the World Bank, by making financial assistance conditional on adopting neoliberal policies.

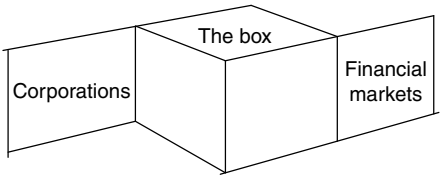

Figure 12.4 Lifting the lid and unpacking the box

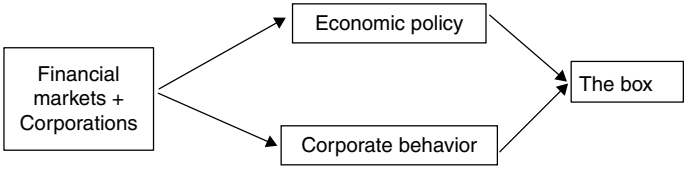

Figure 12.5 The mechanics of financialization

The new model created a growing "demand gap" by gradually undermining the income and demand-generation process. The role of finance was to fill that gap. Within the USA, financial deregulation, financial innovation, and speculation enabled finance to fill the demand gap by lending to consumers and spurring asset price inflation. US consumers in turn filled the global demand gap.

Finally, the enduring strength of the neoliberal policy box derives from corporations and financial markets that constitute the support of the financialization regime. Continuing with the metaphor of a box, corporations and financial markets constitute the sides that give political and economic strength to the box, as illustrated in Figure 12.4. Absent those side supports, a four-sided box would be prone to collapse. The box metaphor therefore illustrates both how workers are pressured and how economic regimes require the support of economic and political power.

Figure 12.5 shows the economic mechanics of financialization. The basic logic is that financial markets have captured control of corporations, which now serve financial market interests along with the interests of top management. That combination drives corporate behavior and economic policy, producing an economic matrix that puts wages under continuous pressure and raises income inequality. It also produces the types of microeconomic behavior among corporate managers that was described in Chapters 6 and 7. Financialization (or financial neoliberalism) is distinguished from pure neoliberalism in two ways. First, there is the reliance on financial markets to fill the demand gap created by

neoliberal economic policies. Second, financial markets become the masters of corporations and thereby change corporate behavior so that it resembles more closely that of financial markets.

12.2 Economic ideas and financialization

Economists have played a critical role in constructing and supporting the financialization paradigm, which is where ideas enter the picture. Thus, the six sides of the box have been supported by mainstream economic theory which has provided justification for the policies and outcomes.

Corporate globalization has been justified by appeal to neoclassical trade theory based upon comparative advantage and by appeal to neoclassical arguments for deregulating financial markets and allowing uncontrolled international capital flows. The attack on government has relied on Friedman's (1962) arguments for a minimalist or "night watchman" state. Moreover, Chicago school economics recommends that even market failures be ignored, because government intervention to fix them can give rise to even more costly government failure.

The retreat from full employment has been driven by new classical macroeconomics that substituted the notion of a natural rate of unemployment and a vertical Phillips curve for the negatively sloped long-run Phillips curve (Friedman, 1968). That switch replaced concern about employment with concern about inflation. The theoretical justification is that policy can have no permanent impact on employment, and the market gravitates quickly by itself to full employment. *Ergo*, monetary policy should concern itself only with inflation, which is something policy can control. Moreover, it should aim for low inflation because inflation is a "bad."

The push for so-called "flexible" labor markets has been driven by the neoclassical construction of labor markets based on marginal product theory. That theory has fuelled an attack on unions, minimum wages, and employment protections, all of which are characterized as labor market "distortions." This view of labor markets also fits with Friedman's (1968) macroeconomic natural rate of unemployment theory, which argues that equilibrium unemployment is due to labor market frictions and distortions.

Increased corporate power has been justified by the shareholder value model of corporations, which claims that wealth and income is maximized if corporations maximize shareholder value without regard to other interests. Simultaneously, financial market control of corporations has been justified on the grounds that there exist principal–agent

problems that cause managers not to maximize shareholder value, and this is to be solved by financial markets. First, managers' interests are to be aligned with shareholder interests via bonus payments and stock options. Second, financial markets provide a market for corporate control that ensures corporations are disciplined by shareholders (Jensen and Meckling, 1976).

Lastly, the expansion of financial markets has been promoted by appeal to the theory of efficient markets (Fama, 1970); claims that speculation is stabilizing (Friedman, 1953); and the need for a robust market for corporate control that ensures corporations are disciplined by shareholders. Additionally, Arrow and Debreu's (1954) contingent claims theory has been used to justify exotic financial innovation in the name of risk spreading, portfolio diversification, and filling in missing markets. Lastly, Tobin and Brainard's (1968, 1977) q-theory has been used to justify the claim that stock markets do a relatively good job directing investment and the accumulation of real capital.

12.3 The financial crisis of 2008 and the continuing importance of ideas

Economists' ideas have played a critical role in shaping and justifying the financialization regime, and their ideas remain critical in the wake of the financial crisis of 2008. That is because how the crisis is interpreted and explained will influence importantly how politics and economic policy evolve.

Broadly speaking, there exist three different perspectives (Palley, 2012, chapter 3):

> Perspective # 1 is the hard-core neoliberal position, which can be labeled the "government failure hypothesis". In the USA it is identified with the Republican Party and the Chicago School of Economics.
>
> Perspective # 2 is the softcore neoliberal position, which can be labeled the "market failure hypothesis". It is identified with the Obama administration, half of the Democratic Party, and the MIT economics departments. In Europe it is identified with Third Way politics.
>
> Perspective # 3 is the progressive position which can be labeled the "destruction of shared prosperity hypothesis". It is identified with the other half of the Democratic Party and the labor movement, but it has no standing within major economics

departments, owing to their suppression of alternatives to orthodox theory.

The government failure hypothesis holds that the crisis was rooted in the US housing bubble and bust, which was due to failure of monetary policy and government intervention in the housing market. With regard to monetary policy, the Federal Reserve pushed interest rates too low for too long in the prior recession. With regard to the housing market, government intervention drove up house prices by encouraging home-ownership beyond people's means. The hard-core perspective therefore characterizes the crisis as essentially a US phenomenon.

The market failure hypothesis holds that the crisis was due to inadequate financial regulation. First, regulators allowed excessive risk taking by banks. Second, regulators allowed perverse incentive pay structures within banks that encouraged management to engage in "loan pushing" rather than "good lending." Third, regulators pushed both deregulation and self-regulation too far. Together, these failures contributed to financial misallocation, including misallocation of foreign saving provided through the trade deficit. The softcore perspective is therefore more global, but it views the crisis as essentially a financial phenomenon.

The progressive "destruction of shared prosperity" argument holds that the crisis was rooted in the neoliberal economic paradigm, described above, that has guided economic policy for the past 30 years. That paradigm infected finance via inadequate regulation and via faulty incentive pay arrangements, but financial market regulatory failure was just one element. Wage stagnation and growing income created a growing demand gap that was plugged by finance, but plugging the gap was always destined to become problematic because there are limits to sustainable asset price inflation and debt burdens.

These three different perspectives make clear what is at stake, as each recommends its own different policy response. For government failure proponents, the recommended policy response is to double-down on the policies of financial neoliberalism by further deregulating financial and labor markets; deepening central bank independence and the commitment to low inflation; and further limiting government via fiscal austerity.

For market failure proponents the recommended policy response is to tighten financial regulation but continue with all other aspects of the existing neoliberal policy paradigm. That means continued support for corporate globalization, so-called "labor market flexibility," low inflation targeting, and fiscal austerity.

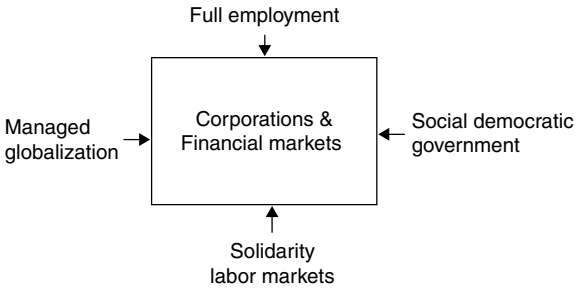

Figure 12.6 The structural Keynesian policy box

For proponents of the destruction of shared prosperity hypothesis the policy response is fundamentally different. The challenge is to replace the neoliberal paradigm with a "structural Keynesian" paradigm that repacks the policy box and restores the link between wage and productivity growth.

This structural Keynesian paradigm is illustrated in Figure 12.6. The goal is to take workers out of the box and put corporations and financial markets in, so that they are made to serve the broader public interest. That requires replacing corporate globalization with managed globalization; restoring commitment to full employment; replacing the neoliberal anti-government agenda with a social democratic government agenda; and replacing the neoliberal labor market flexibility with a solidarity-based labor market agenda.

Managed globalization means a world with labor standards, coordinated exchange rates, and managed capital flows. A social democratic agenda means government ensuring adequate provision of social safety nets, fundamental needs such as healthcare and education, and secure retirement incomes. A solidarity-based labor market means balanced bargaining power between workers and corporations, which involves union representation, adequate minimum wages and unemployment insurance, and appropriate employee rights and protections. Lastly, since the neoliberal model was adopted globally, there is a need to recalibrate the global economy. This is where the issue of "global rebalancing" enters, and emerging market economies need to shift away from export-led growth strategies to domestic demand-led strategies.

The critical insight is that each perspective carries its own policy prescriptions. Consequently, the explanation which prevails will strongly impact the course of economic policy. That places economic ideas at

the center of the political contest, as it influences which explanation prevails.

12.4 Obstacles to change

The economic crisis that began in late 2007 has severely dented the economic regime of financialization. The depth of the crisis has already produced a policy turn to "emergency" Keynesianism, but there are profound political, intellectual and sociological obstacles to deeper change in macroeconomics and economic policy.

12.4.1 Politics and the split among social democrats

A first obstacle concerns politics and the fact that social democratic political parties are split regarding the neoliberal economic paradigm. This political split holds for the Democratic Party in the USA, the Labour Party in the UK, and the Social Democratic Party in Germany.

Figure 12.7 illustrates the split. At the most fundamental level there is a divide between those who see the neoliberal economic paradigm as sound and those who see it as fundamentally flawed; both neoliberals and Third Way social democrats see neoliberalism as sound, while labor social democrats see it as fundamentally flawed. The political problem is that this splits social democrats, making it harder to dislodge the paradigm.

Neoliberals continue to promote the paradigm, and their response to the crisis has been to try and shift blame onto government, arguing that the crisis is another example of government failure. For instance, conservatives (see for example Schiff, 2008) in the USA are falsely blaming the

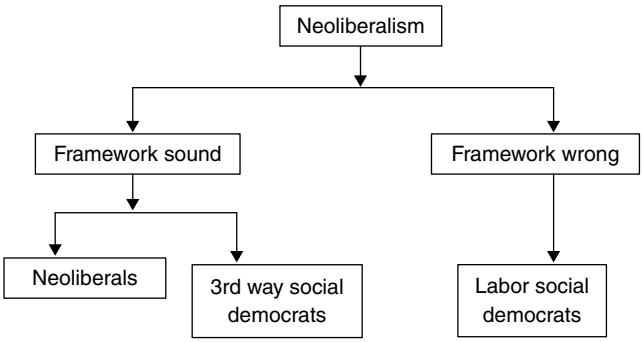

Figure 12.7 The political dilemma posed by neoliberalism

government sponsored mortgage giants Fannie Mae and Freddie Mac for causing the crisis. The 1977 Community Reinvestment Act, which aims to promote home ownership among disadvantaged communities, has also been falsely blamed.[1]

Third Way social democrats also remain committed to the neoliberal model. The key difference from neoliberals is that Third Way social democrats support stronger financial regulatory reform, and they also see a need for "helping hand" programs to help those injured by the market's invisible hand. In the USA, the Third Way "New Democrat" explanation of the Bush administration's economic failure is that it abandoned budget discipline and pursued inegalitarian tax and social policy. That is a critique of policy rather than a critique of paradigm.

This Third Way acceptance of the neoliberal economic paradigm creates a division with labor social democrats who want to replace neoliberalism. That division in turn creates a major political conundrum: on one hand, if labor social democrats split from Third Way social democrats they risk a full-blown neoliberal triumph; on the other hand, if they stick in fractious union with Third Way social democrats, the risk is a gradual entrenchment of neoliberalism. The only satisfactory solution is the creation of a new structural Keynesian consensus, and that calls for placing economic theory and vision at the center of the political stage.

12.4.2 Intellectual opinion

The importance of economics points to a second obstacle to change, which is that neoliberal economics remains intellectually dominant in academic and public policy discourse. Though events have created an opportunity to end the Age of Milton Friedman and replace neoliberalism, events are running ahead of the "climate of opinion," which remains dominated by neoliberalism. The political environment may have become more favorable to change, but a generation of one-sided economic education impedes change. That educational bias affects policymakers, economic advisers, think-tanks, and the media.

Among economists, the dominant analytical framework is the neoclassical dynamic general equilibrium real business cycle model, adjusted to include price rigidities by so-called "New Keynesians." The assumptions of this model – competitive market clearing, the loanable funds theory of interest rates, and the neoclassical theory of labor markets – lace both professional and public discourse. These assumptions generate the conventional neoliberal prescriptions regarding labor market flexibility, balanced budgets, desirability of unimpeded international

financial flows and free trade, monetary policy guided by the natural rate of unemployment, and supply-side economics that emphasizes tax cuts.

The implication is that as long as economic thinking remains dominated by the neoclassical dynamic general equilibrium real business cycle framework, mainstream economics will constitute a major obstacle to change.

12.4.3 The sociology of economics

The importance of intellectual understandings – what Milton Friedman (2002, p.vii) termed "the climate of opinion" – in turn spotlights a third obstruction to change, which is the sociology of the economics profession. This sociology operates to exclude and ignore alternative points of view. That practice is justified by appeal to a science myth that claims that neoclassical economics is scientifically proven truth while other points of view are scientifically wrong.

The neoclassical science myth plays a critical function, which explains the repeated claims that neoclassical economics is science. This function is to support the sociological practice that has mainstream economists labeling dissidents as wrong. That in turn justifies cleansing dissidents from economics departments and ignoring dissidents in heterodox departments. This in turn strips dissidents of intellectual standing, thereby diminishing their capacity to challenge the neoliberal paradigm.

The deeper sociological problem is that academic economics is a club in which existing members elect new members. Today, club members elect only those who subscribe to the current dominant paradigm, with this behavior being justified by appeal to the science myth. That poses an intractable sociological obstruction to changing economics and opening it to alternative points of view (Palley, 1997c).

12.4.4 Cuckoo economics

Lastly, there is the obstacle of "cuckoo" economics. The cuckoo bird takes over the nests of other birds by surreptitiously laying its eggs in their nests and having others raise them. In many regards, neoliberal economics does the same to Keynesian economics. This serves to create confusion, blur distinctions, and promote the claim that Keynesian ideas are already incorporated and have nothing to contribute.

The practice of cuckoo economics is evident in the tendency of mainstream economists to recommend Keynesian policies in times of economic crisis. Thus, in crises many economists support expansionary discretionary fiscal policy and robust interest rate reductions even

though their theoretical models are hard-pressed to justify such actions. However once the economy stabilizes, that Keynesian policy advice is suspended.

New Keynesian economics is the ultimate example of cuckoo economics. It is impossible to read Keynes' (1936) *General Theory* and believe his theory of unemployment rested on the combination of imperfect competition and price adjustment "menu" costs. However, that is the claim of New Keynesians, and their adoption of the Keynesian label serves to confuse debate and dismiss authentic Keynesian claims about the exclusion of Keynesianism (for instance see De Long, 2007). The reality is that new Keynesian economics is a form of real business cycle theory. It should really be called "new Pigovian economics," as it is firmly rooted in the market imperfections tradition of Pigou rather than Keynes.

The latest example of cuckoo economics is "hip" orthodoxy and behavioral economics (Haynes, 2007). Thus, some mainstream economists are now embracing ideas from social psychology that critics of the mainstream have long talked about. These ideas include concerns with relative standing (Veblen, 1899; Duesenberry, 1949), fairness, and less than perfect rationality. The trick behind the new behavioral paradigm is that it draws on arguments made by critics of the mainstream, but it takes only those ideas that leave unchanged the core analytical assumptions that drive modern neoclassical macroeconomics. This capacity to selectively incorporate reflects an amoeba-like property of neoliberal economics whereby it has an astounding capacity to reinvent itself without real change.

12.5 Conclusion: ideas, political power, and economic policy

Reflection on the economic policies that characterize financial neoliberalism shows that ideas really do matter, as evidenced by the fact that the fingerprints of economists are all over the neoliberal policy box. But it is not just ideas that matter. It is the combination of ideas and power. Ideas have bolstered the power of financial elites and elites have then used their power to win the war of ideas.

Viewed from the perspective of possibility for change, that means there is a double challenge. Change requires winning both the political fight and the war of ideas. It is no good winning one without the other. It is no good winning the political battle without winning the war of ideas. In the USA, that is the lesson of the 1990s and the Clinton Administration, and it is also a lesson from the first three years of the Obama Administration.

Likewise, it is no good winning the war of ideas absent the political power to implement them.

Just over 30 years ago, in the mid-1970s, wages started to stagnate, income inequality started to increase rapidly, and the policies and thinking associated with financialization came to dominate the political mainstream. A big reason for that is Keynesians, New Dealers, and labor unions lost the war of ideas. The financial crash of 2008 and the economic crisis that has ensued provide an opportunity to challenge and reverse that domination. Taking advantage of this opportunity requires documenting the poor economic performance that has characterized the financialization regime; identifying the flaws in the economic theory that has justified financialization; and developing a coherent alternative theory and set of policies. That is what this book has been about.

Notes

Chapter 2: Financialization: What It Is and Why It Matters

1. Stockhammer (2007) has documented that growth in the EU has also been tepid over the past twenty-five years during the era of financialization.
2. One caveat to this argument is from second-best theory. If markets are incomplete, expanding the number of markets can theoretically worsen outcomes by increasing the returns to distorted trades, thereby amplifying their volume. However, this is a theoretical possibility and there is no *a priori* reason to believe that this will actually happen.
3. Government debt refers to the total issued debt of federal, state, and local government.
4. The idea of describing policy with the metaphor of a box is attributable to Ron Blackwell of the AFL-CIO.
5. Conventional economic theory charges that higher European unemployment rates are the result of rigid labor markets. Structural Keynesian analysis maintains that the principle cause of higher European unemployment is macroeconomic policy failure (Palley, 1998, 2005b).
6. The workings of a system based on ABRR and its advantages are described by Palley (2000, 2003a, 2004a).

Chapter 3: The Macroeconomics of Financialization: A Stages of Development Approach

1. For purposes of simplicity, the model does not analyze the division of wealth between workers and managers. The coefficients α_3 and α_4 can be thought of as weighted average coefficients of worker and manager propensities to consume out of dividends and wealth, with the weights being equal to the respective ownership shares of workers and managers.
2. If $v = 1$ then firms pay out all of their profits after financing investment. If $v < 1$ they retain some part of profits, which implies they accumulate cash balances or other financial assets.
3. From a Cambridge capital critique perspective, specifying growth as a function of the investment share of output makes more sense. That is because the Cambridge capital critique denies the existence of aggregate capital.
4. The term iD_{-1} can be thought of as the real value of debt interest payments because the model abstracts from issues concerning inflation.

Chapter 4: The Simple Analytics of Debt-driven Business Cycles

1. Tobin (1980) recognizes the significance of Fisher's (1933) distinction between the propensity to spend of debtors and creditors. However, his focus is static macroeconomics and the impact of price level reduction on AD, whereas the current focus is on business cycle dynamics.
2. Specification of the debt service burden in real terms implies abstraction from any effects of inflation. Such an abstraction is theoretically accurate if all debt is floating rate and the real interest rate is constant. In this case, changes in inflation produce one-for-one increases in the nominal interest rate and there is no redistribution between debtors and creditors. If either of these assumptions is violated, inflation would have real effects operating through either or both the existing stock of debt and the flow of new borrowing. If debt is non-floating rate, then increases in inflation benefit debtors, while decreases benefit creditors. If the nominal interest rate adjusts by less than the inflation rate, then increases in inflation benefit borrowers while decreases benefit creditors.
3. The Routh–Hurwicz necessary and sufficient conditions for stability are $1 + A_1 - A_2 > 0$, $1 - A_2 > 0$, and $1 - A_1 - A_2 > 0$.
4. One problem with firm debt models of the business cycle is that they frequently include non-linear mechanisms that make it difficult to distinguish whether it is debt or non-linearity that is responsible for the cycle. For instance, Gallegati and Gardini (1991) include a non-linear profit function that has profits initially rising with output and then falling. Since profits affect investment and AD, the non-linearity of the profit function generates a non-linear investment function which drives the cycle. Skott (1994) presents another non-linear investment model of a business debt-driven business cycle that emphasizes financial fragility defined as a debt service ratio. Financial fragility constrains additional borrowing to finance investment for Stiglitz and Weiss (1981) credit-rationing reasons and a business cycle emerges because of the non-linear investment function.
5. Debt service is assumed to be paid one period in arrears, and hence the terms rD_{t-1}.
6. The Kiyotaki and Moore (1997) and Bernanke et al., (1996, 1999a) are also full employment models, which is another significant difference. In their models, debt constrains firms' ability to accumulate capital, thereby constraining aggregate supply (AS). The economy operates at full employment, but full employment output fluctuates because of balance sheet congestion effects that cause cyclical fluctuations in investment, which in turn cause cyclical fluctuations in potential output. Empirically, it is implausible that actual fluctuations in investment are sufficiently large to cause fluctuations in the capital stock that can account for fluctuations in output. In reality, output fluctuates but the capital stock barely moves. That suggests it is not capital stock effects operating on AS that drive the business cycle.
7. "Hedge" financing has cash flows covering interest and principal payments. "Speculative" financing has cash flows covering interest costs. "Ponzi" financing has cash flows inadequate to cover even interest costs, and investors anticipate making profits via capital gains.

8. Minsky's thinking has a temporal dimension to it not captured in Equation (7′). This temporal dimension has the coefficient a_4 change over time. This can be captured by making a_4 a function of income so that $a_4 = f(y_t)$ where $f' > 0$. However, that renders the model non-linear.
9. Jarsulic (1989) presents an investment-driven business cycle model with endogenous money. His model focuses on the implications of endogenous money for interest rates. It makes no distinction between bank-financed and bond-financed lending, nor does it make a distinction between the propensities to spend of debtors and creditors.

Chapter 5: Deflation and Inflation Dynamics with Debt

1. Inside debt contrasts with outside debt, which is debt issued by government.
2. Tobin's model assumes a constant nominal money supply and zero productivity growth which generates a zero-inflation steady-state equilibrium. However, the model embeds a natural rate of unemployment and is therefore consistent with any equilibrium rate of inflation determined by the steady-state rate of nominal money supply growth, which the monetary authority is free to set. If the steady-state inflation rate is positive, the steady-state real interest rate is slightly higher to maintain demand (E) equal to potential output (y^*). This is because a positive steady-state inflation rate generates a positive Tobin–Mundell effect that reduces the demand for money and increases demand for real output.
3. Note that even though the nominal money supply is fixed, inflation can continue to accelerate because the decrease in real money demand exceeds the decrease in real money supply resulting from higher prices. That creates the monetary space for further inflation and a higher price level.
4. Inside debt effects can be modeled in a number of ways. The current specification is the simplest and is in terms of real debt, D/p. A second possibility is in terms of debt service burdens, $v = i(p,..)D/p$. If existing debt is fixed rate, this is equivalent to the simple specification. However, if existing debt is floating rate, a lower price level can lower the nominal interest rate. In this event, the Fisher debt effect requires $\delta v/\delta p < 0$. A third possibility is in terms of the debt service–income ratio, $i(p,..)D/py$. Assuming the Fisher debt effect holds, then inflation and deflation can be even more prone to instability. This is because excess/deficient demand leads to inflation/deflation and output expansion/contraction, and output adjustment aggravates the Fisher debt effect by increasing/lowering the denominator and lowering/increasing v.
5. If debt is floating rate, then higher nominal interest rates that move with inflation can negate the Fisher debt effect.

Chapter 6: Herd Behavior: Safety in Numbers

1. It is not necessary for managerial contracts to explicitly contain a relative performance clause. All that is needed is for managers to believe that their promotions and lifetime earnings depend on relative performance.

2. The model has been set up in terms of investment options having a zero payout in one state, and a non-zero payout in the other. This payout structure greatly simplifies the algebra, and helps reveal the economic foundation of the model. However, it is possible to introduce investment possibilities that have non-zero payouts in both states, and also have different rates of return.
3. The importance of the parameter b for herd behavior is evident from consideration of the relative size of the cross-effect of a change in beliefs to the own-effect. Thus, $[dY_1/dp]/[dX_1/dp] = b/[a + b]$. This ratio is increasing in b so that increases in b elicit larger herd responses.

Chapter 7: Short-termism: The Problem of Managerial Turnover

1. Bebchuk and Stole (1993) show that asymmetric information in financial markets can also lead to over-investment in long-term projects. This can occur if managers' rewards are based on stock prices, and the stock market observes the level of long-term investment and values it. In this case, managers may over-invest to send a "false" positive signal to the market.

Chapter 8: A Theory of Minsky Super-cycles and Financial Crises

1. The theoretical view developed in this chapter complements Wray's (2008) case study analysis of the current financial crisis, the seeds of which he traces back to the early 1970s and before.
2. For Minsky, these agents were business, as he gave little attention to household borrowing.
3. Models should be judged on a thought organizing and thought illumination criterion. The trouble is that they are increasingly judged on whether they are a "mirror of reality". Not only is the creation of such a mirror an impossible task, making it the criterion for modeling results in dismissing "thought organizing" modeling while simultaneously encouraging misguided "mirror of reality" modeling. This tendency has likely worked to keep Minsky's ideas out of mainstream economics.
4. This mechanism has similarities with the noise trader mechanism described by De Long et al. (1990).
5. An alternative resolution is that of jumping to the stable saddle path solution. That trick is implausible in terms of what people in the real world understand about the economy, and it also does nothing to address the fundamental issue, which is about the character of the economic process.
6. The return of *laissez faire* thinking was also likely encouraged by the Cold War, which placed the ideology of free markets in conflict with the ideology of central planning. As part of winning the debate over economic ideology, the capacity of markets was overstated and their limitations understated.
7. Davidson's (1991) distinction between ergodic and non-ergodic processes provides a similar justification for the dominance of discretion over rules-based policy making.

Chapter 9: Inside Debt and Economic Growth

1. The growth effect of government (outside) debt is a separate question that requires a treatment of its own.
2. The cyclical behavior of the markup is an empirical issue of contention since the markup determines the profit share. The assumption in Equation (11) is that the markup is pro-cyclical, with firms raising markups in response to more robust demand conditions. However, it could also be counter-cyclical if workers are able to bargain a larger share of output as capacity utilization rises. Rotemberg and Saloner (1986) argue the markup is counter-cyclical for game-theoretic competitive reasons as firms try to increase market share in booms.
3. Debtor consumption, C_D, must also grow at the rate of output growth in steady state to ensure constant consumption shares. This condition is satisfied if debtor borrowing grows at the rate of output growth.
4. The distinction between wage-led and profit-led economies is attributable to Taylor (1983) who focused on the impact of income distribution on the level of economic activity. Bhaduri and Marglin (1990) focus on the impact of income distribution on growth and use the terminology "stagnationist" instead of wage-led, and "exhilarationist" instead of profit-led.
5. This pattern follows from the Keynesian stability assumption that $\sigma_u - zdg_u < g_u$. Points to the right of the IS represents high rates of economic activity that generate excess supply because aggregate saving is more positively responsive to capacity utilization than investment.
6. Note, the IS rotates clockwise as the economy transitions from a wage-led to a profit-led structure, with its slope changing from negative to positive. The economic logic is the goods market becomes more positively sensitive to an increase in the profit share, requiring a smaller increase in capacity utilization to maintain goods market equilibrium.
7. Palley (1994) has a condition $D/\varphi Y = k$. Since the interest rate is constant that specification is equivalent to embedding the interest rate in the constant, k.
8. If $i < g$ it is possible the numerator becomes negative and the Keynesian stability condition is violated. The economic logic is increased capacity utilization raises the debt ceiling, increasing borrowing and further increasing capacity utilization because the growth rate exceeds the interest burden on borrowing.

Chapter 10: A Monetary Policy Framework for Asset Price Bubbles

This chapter was first published under the same title in M.H. Wolfson and G. Epstein (eds) (2013), *The Handbook of the Political Economy of Financial Crises*, Oxford University Press, 624–643.

1. Former Federal Reserve Chairman Greenspan opposed formal inflation targeting and targeting asset bubbles (Pearlstein, 2002; Greenspan, 2002a, 2002b). Current Chairman Ben Bernanke favored formal inflation targets but was against targeting asset bubbles (Bernanke, 2002; Bernanke and Mishkin, 1997; Bernanke et al., 1999).
2. Former Federal Reserve Governor Mishkin (2008) has made the additional argument that there is no need to target bubbles because their adverse effects

can be nipped in the bud (that is, cleaned up) if conventional interest rate policy is quick to respond when they burst. That is an empirical argument, and there are strong grounds to doubt its validity. The Federal Reserve was quick to lower interest rates in response to the bursting of the US house price bubble, to the extent of earning the ire of one well known economist (Buiter, 2008a), yet the economy has still tumbled into what has proved the worst economic crisis since the Great Depression.

3. The output target can be interpreted as the full employment level of output or the level of output consistent with the monetary authority's inflation target.
4. It is worth distinguishing between debt-financed asset bubbles and other asset bubbles. The former are associated with real estate bubbles and are particularly damaging because of the debt footprint they leave behind. The latter are more associated with stock market bubbles and appear to be less damaging and easier to escape. However, they also have real costs associated with distortion of investment decisions and the composition of output.
5. For simplicity, the current model does not distinguish between residential and non-residential investment. Such sector distinctions can be introduced by adding separate investment functions, in which case higher asset (house) prices could spur residential investment spending. Additionally, residential investment spending would then be negatively impacted by debt footprint effects.
6. The exchange rate negatively impacts investment by increasing import competition, which reduces profitability (see Blecker, 2004). In a more complicated model the level of debt could be decomposed into household and firm debt. The former would impact consumption while the latter would impact investment spending.
7. If debt is decomposed into household and corporate debt, this would require introducing separate loan demands for household and corporate debt, as well as introducing separate loan interest rate equations.
8. The need for uniform regulation of the financial system based on function and not form is emphasized by D'Arista and Schlesinger (1993). They presciently foresaw that the development of an unregulated parallel banking would lead to the type of credit excesses witnessed in the US house price bubble and mortgage crisis.
9. As with ABRR, counter-cyclical capital standards also rely on policy discretion and the need to be able to identify bubbles. If these issues are obstacles to ABRR, then they are equally obstacles to counter-cyclical capital standards.
10. Purchasing additional bonds would tend to drive up bond prices, which would mitigate the automatic stabilizer effect, but the net effect would still be stabilizing.

Chapter 11: Monetary Policy and Central Banking after the Crisis: The Implications of Rethinking Macroeconomic Theory

This chapter was first published as "Monetary policy and central banking after the crisis: the implications of rethinking macroeconomic theory," in Gerald Epstein and Martin Wolfson (eds), *The Handbook on Political Economy*

of Financial Crises, Oxford: Oxford University Press, 2013, pp. 624–643. By permission of Oxford University Press, USA ©.

1. Having the Federal Reserve become the banking system regulator actually expands its powers, though balanced against this the Federal Reserve has surrendered its consumer protection role to the new Consumer Financial Protection Bureau established by the Dodd–Frank Act (2010).
2. The Greenspan put was the belief that under Chairman Greenspan the Federal Reserve would sharply lower interest rates to prevent large stock market declines.
3. The International Monetary Fund (2011) commissioned a similar report on its failure to foresee the crisis which was prepared by its Independent Evaluation Office.
4. Many of the arguments presented in this sub-section were developed earlier in Palley (2006).
5. The Federal Reserve has recently started paying interest on reserves of banks. A system of ABRR would require ending that, as paying interest on reserves undermines ABRR by removing the penalty that ABRR seeks to impose on particular asset classes.

Chapter 12: The Political Economy of Financialization

1. See Ritholtz (2008a, b) for a rejection of the claim that the housing crisis was caused by the Community Reinvestment Act and the government sponsored mortgage lenders, Fannie Mae and Freddie Mac.

References

Ackley, G. (1951) "The wealth – saving relationship," *Journal of Political Economy*, April: 154–61.

Akerlof, G.A., Dickens, W.T., and Perry, G.L. (2000) "Near-rational wage and price setting and the long run Phillips curve," *Brookings Papers on Economic Activity*, 1: 1–60.

Arestis, P., and Sawyer, M. (2006) "Interest rates and the real economy," in Gnos, C., Rochon, L.P. (eds), *Post Keynesian Principles of Economic Policy*, Cheltenham, UK: Edward Elgar, 3–20.

Arrow, K.J., and Debreu, G. (1954) "Existence of an equilibrium for a competitive economy," *Econometrica*, 22: 262–90.

Banerjee, A.V. (1992) "A simple model of herd behavior," *Quarterly Journal of Economics*, 108: 797–817.

Barro, R.J., and Gordon, D.B. (1983) "A positive theory of monetary policy in a natural rate model," *Journal of Political Economy*, 91: 589–610.

Bebchuk, L.A., and Grinstein, Y. (2005) "The growth of executive pay," *Oxford Review of Economic Policy*, 21: 283–303.

Bebchuk, L.A., and Stole, L.A. (1993) "Do short-term objectives lead to under- or overinvestment in long-term projects?" *Journal of Finance*, 48: 719–29.

Bernanke, B.S. (1983) "Nonmonetary effects of the financial collapse in the propagation of the great depression," *American Economic Review*, 73: 257–76.

—— (2002) "Asset price bubbles and monetary policy," Remarks before the New York Chapter of the National Association for Business Economics, New York, October 15.

—— (2004) "The great moderation," Remarks at the Meetings of the Eastern Economic Association, Washington DC, February 20, available at http://www.federalreserve.gov/boarddocs/speeches/2004/20040220/default.htm.

—— (2010) "Monetary policy and the housing bubble," Speech presented at the annual meeting of the American Economic Association, Atlanta, Georgia, January 3, available at http://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm.

Bernanke, B., and Gertler, M. (1996) "The financial accelerator and the flight to quality," *Review of Economics and Statistics*, 78: 1–15.

Bernanke, B., Gertler, M., and Gilchrist, S. (1999) "The financial accelerator in a quantitative business cycle framework," in Taylor & Woodford (eds), *Handbook of Macroeconomics*, Volume 1, Elsevier Science, 1341–93.

Bernanke, B.S., Laubach, T., Mishkin, F.S., and Posen, A.S. (1999) *Inflation Targeting: Lessons from the International Experience*, Princeton: Princeton University Press.

Bernanke, B.S., and Mishkin, F.S. (1997) Inflation targeting: a new framework for monetary policy? *Journal of Economic Perspectives*, 11: 97–116.

Bhaduri, A., and Marglin, S.A. (1990) "Unemployment and the real wage: the economic basis for contesting political ideologies," *Cambridge Journal of Economics*, 14: 375–93.

Blair, M.M., and Stout, L.A. (1999) "A team production theory of corporate law," *Virginia Law Review*, 85 (2) (March): 248–328.

Blanchard, O.J. (2008) "The state of macro," MIT Department of Economics Working Paper, August 12, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id= 1235536.

Blanchard, O., Dell'Arica, G., and Mauro, P. (2010) "Rethinking macroeconomic policy," Research Department, IMF, Washington DC, February, available at http://www.imf.org/external/pubs/ft/spn/2010/spn1003.pdf.

Blinder, A. (2008) "Two bubbles, two paths," *The New York Times*, June 15, available at http://www.nytimes.com/2008/06/15/business/15view.html

—— (2010a) "How central should the central bank be?" *Journal of Economic Literature*, XLVIII (March) 1: 123–33.

—— (2010b) "Commentary: rethinking monetary policy in light of the crisis," Comments at a symposium sponsored by the Kansas City Federal Reserve Bank, August, available at http://www.kansascityfed.org/publicat/sympos/2010/blinder-remarks.pdf.

—— (2010c) "Revisiting monetary policy in a low inflation and low utilization environment" powerpoint presentation at a conference sponsored by the Boston Federal Reserve Bank, October 16, available at http://www.bos.frb.org/RevisitingMP/presentations/Blinder.pdf.

Boyer, R. (1990) *The Regulation School: A Critical Introduction* (translated C. Charney), Columbia University Press: New York.

—— (2000) "Is a finance-led growth regime a viable alternative to Fordism?" *Economy and Society*, 29: 111–45.

Boyer, R., and Saillard, Y. (2002) *Regulation Theory: The State of the Art*, Routledge: London.

Brainard, W., and Tobin, J. (1968) "Pitfalls in financial model building," *American Economic Review*, 58 (May): 99–122.

—— (1977) "Asset markets and the cost of capital," in Belassa, B. and Nelson, R. (eds), *Economic Progress, Private Values, and Public Policy: Essays in Honor of William Fellner*, New York: North Holland.

Bronars, S.G., and Deere, D.R. (1991) "The threat of unionization, the use of debt, and the preservation of shareholder wealth," *Quarterly Journal of Economics*, CVII (February): 231–54.

Buiter, W. (2008a) The Bernanke put: buttock-clenching monetary policymaking at the Fed, *FinancialTimes.com*, January 22.

—— (2008b) "Lessons from the North Atlantic financial crisis," paper presented at a conference on "the Role of Money markets" jointly organized by Columbia Business School and the Federal Reserve Bank of New York, May 29–30 and available at http://www.nber.org/~wbuiter/NAcrisis.pdf.

Bulow, J.I., Geanakoplos, J.D., and Klemperer, P.D. (1985) "Multimarket oligopoly: strategic substitutes and complements," *Journal of Political Economy*, 93: 488–511.

Caskey, J., and Fazzari, S. (1987) "Aggregate demand contractions with nominal debt commitments: is wage flexibility stabilizing?" *Economic Inquiry*, 25 (October): 583–97.

Chick, V. (1986) "The evolution of the banking system and the theory of saving, investment and interest," *Economies et Societes, Monnaie et Production*, 3: 95–110.

Coghlan, R. (1978) "A new view of money," *Lloyds Bank Review*, 129 (July): 12–28.

Crotty, J.R. (1990) "Owner–manager conflict and financial theories of investment instability: a critical assessment of Keynes, Tobin, and Minsky," *Journal of Post Keynesian Economics*, 12 (Summer): 519–42.

Davidson, P. (1991) "Is probability theory relevant for uncertainty? A Post Keynesian perspective, *Journal of Economic Perspectives*, 5 (Winter): 129–43.

D'Arista, J.W., and Schlesinger, T. (1993) The parallel banking system, *EPI Briefing Paper*, Economic Policy Institute, Washington DC 20036.

Delli Gatti, D., Gallegatti, M., and Minsky, H.P. (1994) "Financial institutions, economic policy and the dynamic behavior of the economy," Working paper No. 126, The Jerome Levy Economics Institute of Bard College, New York, October.

De Long, B. (2007) "What are we, chopped liver?" TPM Café, May 31, http://tpmcafe.talkingpointsmemo.com/2007/05/31/what_are_we_chopped_liver/

De Long, B., and Summers, L. (1986) "Is increased price flexibility stabilizing?" *American Economic Review*, 76: 1031–44.

—— (1991) "Equipment investment and economic growth," *Quarterly Journal of Economics*, 106: 445–502.

De Long, J.B., Shleifer, A., Summers, L.H., and Waldman, R.J. (1990) "Noise trader risk in financial markets," *Journal of Political Economy*, 98: 703–38.

Dew-Becker, I., and Gordon, R.J. (2005) "Where did the productivity growth go? Inflation dynamics and the distribution of income," *Brookings Papers on Economic Activity*, 36 (2): 67–127.

Duesenberry, J.S. (1949) *Income, Saving and the Theory of Consumption Behavior*, Cambridge, Mass.: Harvard University Press.

Dutt, A.K. (1984) "Stagnation, income distribution, and monopoly power," *Cambridge Journal of Economics*, 8: 25–40.

—— (1990) *Growth, Distribution and Uneven Development*, Cambridge University Press: Cambridge.

—— (2005) "Consumption, debt and growth," in M. Setterfield (ed.), *Interactions in Analytical Political Economy*, Armonk, New York: M.E.Sharpe.

—— (2006) "Maturity, stagnation and consumer debt: a Steindlian approach," *Metroeconomica*, 57 (July): 339–64.

Epstein, G. (1992) "A political economy model of comparative central banking," *Review of Radical Political Economics*, 24: 1–30.

—— (2001) "Financialization, rentier interests, and central bank policy," manuscript, Department of Economics, University of Massachusetts, Amherst, MA, December.

—— (2004) "Introduction" in Epstein (ed.), *Financialization and the World Economy*, Northampton, MA: Edward Elgar, 3–16.

Fama, E. (1970) "Efficient capital markets: a review of theory and empirical work," *Journal of Finance*, 25 (May): 383–416.

Fazzari, S.M., Hubbard, R.G., and Petersen, B.C. (1988) "Financial constraints and corporate investment," *Brookings Papers on Economic Activity*, 1: 141–95.

Ferri, P., and Minsky, H.P. (1992) "Market processes and thwarting systems," Working Paper No. 64, The Jerome Levy Economics Institute, Bard College, Annadale-on-Hudson, NY and also published in *Structural Change and Economic Dynamics*, 3: 79–91.

Fisher, I. (1933) "The debt–deflation theory of great depressions," *Econometrica*, 1 (October): 337–57.
Flood, R.P., and Garber, P.M. (1980) "Market fundamentals versus price level bubbles: the first tests," *Journal of Political Economy*, 88: 745–70.
Foley, D.K. (1987) "Liquidity – profit rate cycles in a capitalist economy," *Journal of Economic Behavior and Organization*, 8: 363–76.
Friedman, B.M. (1975) "Targets, instruments, and indicators of monetary policy," *Journal of Monetary Economics*, 1: 443–73.
Friedman, M. (1953) "The case for flexible exchange rates," in *Essays in Positive Economics*, Chicago: Chicago University Press, 157–203.
—— (1962 [2002]) *Capitalism and Freedom*, Chicago: University of Chicago Press, 1962 and fortieth anniversary edition.
—— (1968) "The role of monetary policy", *American Economic Review*, LVIII (May): 1–17.
Gallegati, M., and Gardini, L. (1991) "A non-linear model of the business cycle with money and finance," *Metroeconomica*, 42: 1–32.
Gandolfo, G. (1980) *Economic Dynamics: Methods and Models*, North-Holland: Amsterdam.
Goodfriend, M. (2007) "How the world achieved consensus on monetary policy," *Journal of Economic Perspectives*, 21 (4): 47–68.
Goodhart, C., and Persaud, A. (2008) "A proposal for how to avoid the next crash," *Financial Times*, January 31.
Gordon, R.J., and I. Dew-Becker (2007) "Unresolved issues in the rise of American inequality," paper presented at the Brookings Panel on Economic Activity, Washington, DC, September 7.
Greenspan, A. (2002a) "Economic volatility," Remarks at a Symposium sponsored by the Federal Reserve Bank of Kansas City in Jackson Hole, Wyoming, August 30.
—— (2002b) "Issues for monetary policy," Remarks before the Economic Club of New York, New York City, December 19.
Gwynne, S. (1986) *Selling Money*, New York: Wiedenfeld and Nicolson.
Haynes, C. (2007) "Hip heterodoxy," *The Nation*, June 11.
Hein, E. (2008a) "Rising shareholder power: effects on distribution, capacity utilization and capital accumulation in Kaleckian/Post-Kaleckian models," in Hein, Niechoj, Spahn, and Truger (eds), *Finance-led Capitalism? Macroeconomic Effects of Changes in the Financial Sector*, Metropolis–Verlag, Marburg, 89–120.
—— (2008b) "Shareholder value orientation, distribution and growth: short- and medium-run effects in a Kaleckian model", *Metroeconomica*, forthcoming.
Hein, E., and van Treeck, T. (2007) "Financialization in Kaleckian/Post-Kaleckian models of distribution and growth," IMK Working paper No. 7.
Hein, E., and Vogel, L. (2008) "Distribution and growth reconsidered: empirical results for six OECD countries," *Cambridge Journal of Economics*, 32, 479–511.
Hicks, J.R. (1950) *A Contribution to the Theory of the Trade Cycle*, Clarendon Press: Oxford.
Hirshleifer, J. (1971) "The private and social value of information and the reward to inventive activity," *American Economics Review*, 61: 561–74.
Holmstrom, B., and Ricart i Costa, J. (1986) "Managerial incentives and capital management," *Quarterly Journal of Economics*, 101: 832–60.

International Monetary Fund (2011) "IMF performance in the run-up to the financial and economic crisis: IMF surveillance in 2004–07," prepared by the Independent Evaluation Office of the IMF, Washington DC, February, available at http://www.ieo-imf.org/eval/complete/eval_01102011.html.

Jarsulic, M. (1989) "Endogenous credit and endogenous business cycles," *Journal of Post Keynesian Economics*, 12 (Fall): 35–48.

Jayadev, A., and Epstein, G. (2007) "The correlates of rentier returns in the OECD countries," unpublished manuscript, Department of Economics, University of Massachusetts, Amherst, MA, January.

Jensen, M.J., and Meckling, W.H. (1976) "Theory of the firm: managerial behavior, agency costs and ownership structure," *Journal of Financial Economics*, 3: 305–60.

Johnson, S. (2009) "The quiet coup," *The Atlantic Monthly*, May.

Johnson, S., and Kwak, J. (2010) *13 Bankers: The Wall Street Takeover and the Next Financial Meltdown*, New York: Random House Inc.

Kaldor, N. (1955/56) "Alternative theories of distribution," *Review of Economic Studies*, 7: 83–100.

—— (1970) "The new monetarism," *Lloyds Bank Review*, 97: 1–17.

—— (1982) *The Scourge of Monetarism*, Oxford: Oxford University Press.

Kalecki, M. (1937) "The principle of increasing risk," *Economica*, 4: 440–47.

—— (1943 [1971]) "Studies in economic dynamics" in J. Osiatynski (ed.), *Collected Works of Michael Kalecki*, Volume 2, Oxford: Clarendon Press, 207–338.

Katz, M., and Shapiro, C. (1985) "Network externalities, competition, and compatibility," *American Economic Review*, 75: 424–40.

Keynes, J.M. (1936) *The General Theory of Employment, Interest, and Money*, Macmillan: London.

Kiyotaki, N., and J. Moore (1997) "Credit cycles," *Journal of Political Economy*, 105: 211–48.

Kotz, D.M., McDonough, T., and Reeich, M. (eds) (1994) *Social Structures of Accumulation: The Political Economy of Growth and Crisis*, Cambridge University Press: Cambridge.

Krippner, G. (2004) "What is financialization?" mimeo, Department of Sociology, UCLA.

—— (2005), "The financialization of the American economy," *Socio-Economic Review*, 3, 173–208.

Lavoie, M. (1995) "The Kaleckian model of growth and distribution and its Neo-Ricardian and Marxist critiques," *Cambridge Journal of Economics*, 19: 789–818.

—— (2007) "Financialization issues in a Post Keynesian stock–flow consistent model," paper presented at a conference on Finance-led Capitalism, Berlin, Germany, October 26–27.

Lavoie, M. and Godley, W. (2001/02) "Kaleckian models of growth in a coherent stock – flow Monetary framework: a Kaldorian view," *Journal of Post Keynesian Economics*, 24 (Winter): 277–312.

Leibenstein, H. (1950) "Bandwagon, snob, and Veblen effects in the theory of consumers' demand," *Quarterly Journal of Economics*, 66: 183–207.

Levy, F., and Temin, P. (2007) "Inequality and institutions in 20th century America," Manuscript, MIT.

Markowitz, H. (1959) *Portfolio Selection*, Wiley: New York.
Minsky, H.P. (1959a) "A linear model of cyclical growth," *Review of Economics and Statistics*, 41 (May): 133–45.
—— (1959b) "Monetary systems and accelerator models", *American Economic Review*, 47: 859–83.
—— (1975) *John Maynard Keynes*, New York: Columbia University Press.
—— (1982) C*an "It" Happen Again? Essays on Instability and Finance*, Armonk, NY: M.E.Sharpe.
—— (1986) *Stabilizing an Unstable Economy*, New Haven: Yale University Press.
—— (1992 [1993]) "The financial instability hypothesis," Working paper No. 74, The Jerome Levy Economics Institute of Bard College, New York, and published in Arestis, P. and Sawyer, M. (eds), *Handbook of Radical Political Economy*, Aldershot: Edward Elgar.
—— (1993) "Financial integration and national economic policy," paper presented at the Post Keynesian Workshop, University of Tennessee, Knoxville, July.
—— (2008) "Securitization," Policy Note 2, The Levy Economics Institute of Bard College, New York.
Mishel, L., Bernstein, J., and Shierholz, H. (2009) *The State of Working America 2008/2009*, Ithaca, NY: Cornell University Press.
Mishkin, F. (2008) "How should we respond to asset price bubbles?' Speech at the Wharton Financial Institutions Center and Oliver Wyman Institute's Annual Financial Risk Roundtable, Philadelphia, PA, May 15 available at http://www.federalreserve.gov/newsevents/speech/mishkin20080515a.htm
Modigliani, F., and Ando, A. (1963) "The life cycle hypothesis of saving: aggregate implications and tests," *American Economic Review*, 53 (1): 55–84.
Modigliani, F., and Brumberg, R. (1954) "Utility analysis and the consumption function: an interpretation of cross-section data," in Kurihara, K. (ed.), *Post Keynesian Economics*, New Brunswick, NJ: Rutgers University Press, 388–436.
Modigliani, F. and Miller, M.H. (1958) "The cost of capital, corporation finance and the theory of investment," *American Economic Review*, 48: 261–97.
Moore, B.J. (1988) *Horizontalists and Verticalists: The Macroeconomics of Credit Money*, Cambridge: Cambridge University Press.
Mott, T. (1985/86) "Kalecki's principle of increasing risk and the relation among mark-up pricing, investment fluctuations, and liquidity preference," *Economic Forum*, XV (Winter): 65–76.
Mundell, R. (1963) "Inflation and the real interest rate," *Journal of Political Economy*, 59: 280–83.
Narayanan, M.P. (1985) "Managerial incentives for short-term results," *Journal of Finance*, 40: 1469–84.
Neary, J.P. and Stiglitz, J.E. (1983) "Towards a reconstruction of Keynesian economics: expectations and constrained equilibria," *Quarterly Journal of Economics*, 98 supplement: 196–201.
Palley, T.I. (1991/92) "Money, credit, and prices in a Kaldorian macro model," *Journal of Post Keynesian Economics*, 14 (Winter): 183–204.
—— (1994) "Debt, aggregate demand, and the business cycle: an analysis in the spirit of Kaldor and Minsky, *Journal of Post Keynesian Economics*, 16 (Spring): 371–90.
—— (1995) "Safety in numbers: a theory of managerial herd behavior," *Journal of Economic Behavior and Organization*, 28: 443–50.

—— (1996a) *Post Keynesian Economics: Debt, Distribution, and the Macro Economy*, London: Macmillan Press.
—— (1996b [1997]) "The institutionalization of deflationary policy bias," *Monnaie et Production*, Vol. X of *Economies et Societes*, 247–68. Republished in Hagerman, H. and Cohen, A. (eds), *Advances in Monetary Theory*, Kluwer Acadamic Publishers.
—— (1997a): "Endogenous money and the business cycle," *Journal of Economics*, 65: 133–49.
—— (1997b) "Managerial turnover and the theory of shorttermism," *Journal of Economic Behavior and Organization*, 32: 547–57.
—— (1997c) "The academic jungle: social practice and the survival of economic ideas," *Review of Radical Political Economics*, 29 (September): 22–33.
—— (1998) *Plenty of Nothing: The Downsizing of the American Dream and the Case for Structural Keynesianism*, Princeton University Press.
—— (1999) "General disequilibrium analysis with inside debt," *Journal of Macroeconomics*, 21 (Fall): 785–804.
—— (2000) *Stabilizing Finance: The Case for Asset-Based Reserve Requirements*, Report issued by the Financial Markets Center, Philomont, VA, August, available at http://www.thomaspalley.com/docs/articles/macro_policy/stabilizing_finance.pdf.
—— (2001) "The stock market and investment: another look at the micro foundations of q theory," *Cambridge Journal of Economics*, 25 (September): 657–67.
—— (2003a) "Asset price bubbles and the case for asset based reserve requirements," *Challenge*, 46 (May–June): 53–72.
—— (2003b) "The backward bending Phillips curve: wage adjustment with opportunistic firms," *The Manchester School of Economic and Social Studies*, 71 (1) (January): 35–50.
—— (2004a [2005]) "The causes of high unemployment: labor market sclerosis versus macroeconomic policy," in Hein, Heise and Truger (eds), *Wages, Employment, Distribution and Growth*, Palgrave/Macmillan: London, 2005. Originally published in Stanford and Vosko (eds), *Challenging the Market: The Struggle to Regulate Work and Income*, McGill-Queens University Press, Montreal & Kingston:Canada.
—— (2004b) "Asset based reserve requirements: reasserting domestic monetary control in an era of financial innovation and instability," *Review of Political Economy*, 16 (January): 43–58.
—— (2004c [2008]) "The simple analytics of debt–driven business cycles," paper presented at the Post Keynesian conference, University of Missouri, Kansas City, Kansas.
—— (2005a) "Class conflict and the Cambridge theory of distribution," in B. Gibson (ed.), *The Economics of Joan Robinson: A Centennial Celebration*, Cheltenham: E. Elgar.
—— (2005b) "The questionable legacy of Alan Greenspan," *Challenge*, 48 (6) (November–December): 17–31.
—— (2006) "Monetary policy in an endogenous money economy," in Arestis and Sawyer (eds), *A Handbook of Alternative Monetary Economics*, Edward Elgar: Cheltenham, U.K., 242–57.
—— (2007) "Reviving full employment policy: challenging the Wall Street paradigm," EPI Briefing Paper #191, Economic Policy Institute, Washington

DC, June 2007. Also published as "Seeking full employment again: challenging the Wall Street paradigm," *Challenge*, November/December 2007, 14–50.
—— (2008a) "Keynesian models of deflation and depression revisited," *Journal of Economic Behavior and Organization*, 68 (October): 167–77.
—— (2008b) "Financialization: What it is and why it matters," in Hein, Niechoj, Spahn, and Truger (eds), *Finance-led Capitalism? Macroeconomic Effects of Changes in the Financial Sector*, Metropolis–Verlag, Marburg, 29–60.
—— (2008c [2010]) "Asset price bubbles and monetary policy: why central banks have been wrong and what should be done", Working Paper No. 4. IMK Economics Institute, Dusseldorf, Germany, 2008. Also published as "Asset price bubbles and monetary policy: why central banks have been wrong and what should be done," *Intervention*, 7(1) (2010): 91–107.
—— (2008d) "The Macroeconomics of aggregate demand and the price level," *Investigacion Economica* , LXVII (263), January–March: 49–66.
—— (2009a [2011]) "A theory of Minsky super-cycles and financial crises," IMK Working paper 2/2009, Institute for Macroeconomics, Dusseldorf, Germany and *Contributions to Political Economy*, 29: 1–16.
—— (2009b) "America's exhausted paradigm: macroeconomic causes of the financial crisis and Great Recession," New America Foundation, Washington, DC.
—— (2009c) "The backward bending Phillips curve: competing micro-foundations and the role of conflict," *Investigacion Economica*, LXVII (20), October/December 2009: 13–36.
—— (2011) "The economics of the Phillips curve: formation of inflation expectations versus incorporation of inflation expectations," IMK Working paper 4/2011, Institute for Macroeconomics, Dusseldorf, Germany, available at http://www.boeckler.de/pdf/p_imk_wp_4_2011.pdf. Also published in *Structural Change and Economic Dynamics*, 23 (3) (September 2012): 221–30.
—— (2012) *From Financial Crisis to Stagnation: The Destruction of Shared Prosperity and the Role of Economics*, Cambridge: Cambridge University Press.
Pearlstein, S. (2002) "Fed defends stock bubble performance: greenspan attempts to restore his image," *The Washington Post*, December 22.
Pigou, A.C. (1943) "The classical stationary state," *Economic Journal*, 53: 343–51.
Pollin, R. (1993) "Public credit allocation through the Federal Reserve: why it is needed; how it should be done," in Dymski, G.A., Epstein, G., and Pollin, R., (eds), *Transforming the U.S. Financial System: Equity and Efficiency for the 21st Century*, Armonk, NY:M.E.Sharpe.
Popper, K.R. (1959) *The Logic of Scientific Discovery*, New York: Basic Books.
Power, D., Epstein, G. and Abrena, M. (2003) "Trends in the rentier income share in OECD countries, 1960–2000," Department of Economics, University of Massachusetts, Amherst, MA, April.
Ritholtz, B. (2008a) "Misunderstanding credit and housing crises," The Big Picture, October 2, http://bigpicture.typepad.com/comments/2008/10/misunderstandin.html
—— (2008b) "Fannie Mae and the financial crisis," The Big Picture, October 5, http://bigpicture.typepad.com/comments/2008/10/fannie-mae-and.html
Rotemberg, J.J. and Saloner, G. (1986) "A supergame-theoretic model of price wars during booms," *American Economic Review*, 76: 390–407.
Rowthorn, R. (1982) "Demand, real wages and growth," *Studi Economici*, 18: 3–54.

Samuelson, P.A. (1939) "Interactions between the multiplier analysis and the principle of acceleration," *The Review of Economic and Statistics*, 21 (May): 75–78.

Scharfstein, D., and Stein, J. (1990) "Herd behavior and investment," *American Economic Review*, 80: 465–79.

Schiff, P. (2008) "Don't blame capitalism," *Washington Post*, October 16, A 19.

Schumpeter, J.A. (1939) *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, McGraw-Hill: New York.

Semmler, W., and Franke, R. (1991) "Debt financing of firms, stability, and cycles in a dynamical macroeconomic growth model," in E. Nell and W. Semmler (eds), *Nicholas Kaldor and Mainstream Macroeconomics*, Macmillan, London.

Setterfield, M. (1997a) "Should economists dispense with the notion of equilibrium," *Journal of Post Keynesian Economics*, 20: 47–76.

—— (1997b) *Rapid Growth and Relative Decline: Modeling Macroeconomic Dynamics with Hysteresis*, Macmillan: London.

Shleifer, A., and Vishny, R.W. (1990) "Equilibrium short horizons of investors and firms," *American Economic Review*, 80: 148–53.

Skott, P. (1994) "On the modeling of systemic financial fragility," in A.K. Dutt (ed.), *New Directions in Analytical Political Economy*, Edward Elgar: Cheltenham.

Skott, P., and Ryoo, S. (2008) "Macroeconomic implications of financialization," *Cambridge Journal of Economics*, 32: 827–62.

Stein, J.C. (1989) "Efficient capital markets, inefficient firms, in a model of myopic corporate behavior," *Quarterly Journal of Economics*, 104: 655–69.

Soros, G. (1987) *The Alchemy of Finance*, John Wiley & sons, Inc.: New Jersey.

Stiglitz, J.E., and Weiss, A. (1981) "Credit rationing in markets with imperfect information," *American Economic Review*, 71: 393–410.

Stockhammer, E. (2004) "Financialization and the slowdown of accumulation," *Cambridge Journal of Economics*, 28, 719–41.

—— (2007) "Some stylized facts on the finance-dominated accumulation," unpublished manuscript, Dept. of Economics, VWI, Wirtschaftuniversitat, Wien, Austria, July 16.

Stockhammer, E., and Stehrer, R. (2011) "Goodwin or Kalecki in demand? Functional income distribution and aggregate demand in the short run," *Review of Political Economics*, 43 (December): 506–22.

Tabb, W.K. (2010) "Financializtion in the contemporary social structure of accumulation," in McDonough, T., Reich, M., and Kotz, D.M. (eds), *Contemporary Capitalism and Its Crises: Social Structure of Accumulation Theory for the 21st Century*, Cambridge: Cambridge University Press.

Taylor, L. (1983) *Structuralist Macroeconomics*, Basic Books: New York.

—— (1991) *Income Distribution, Inflation, and Growth*, Cambridge, MA: MIT Press.

Thorbecke, W. (1997) "Who pays for disinflation?" Public Policy Brief 38A, The Jerome Levy Economics Institute of Bard College, Annandale-on-Hudson, New York, December.

Thurow, L. (1972) "Proposals for rechanneling funds to meet social priorities," in Federal Reserve Bank of Boston, *Policies for a More Competitive Financial System*, conference proceedings, June, 179–89.

Tobin, J. (1958) "Liquidity preference as behavior towards risk," *Review of Economic Studies*, 25 (February): 65–86.

—— (1961) "Money, capital, and other stores of value," *American Economic Review*, 51: 26–37.
—— (1965) "Money and economic growth", *Econometrica*, 33: 671–84.
—— (1975) "Keynesian models of recession and depression," *American Economic Review*, 65 (May): 195–202.
—— (1980) *Asset Accumulation and Economic Activity*, Chicago: Chicago University Press.
Tobin, J., and Brainard, W. (1963) "Financial intermediaries and the effectiveness of monetary control," *American Economic Review*, 53 (May): 383–400.
Veblen, T. (1899) *The Theory of the Leisure Class*, New York: Macmillan.
Webb, D.C. (1993) "The trade-off between cash flow and net present value," *Scandinavian Journal of Economics*, 95: 65–75.
Wray, L.R. (2008) "Financial markets meltdown: what can we learn from Minsky?" Public Policy Brief No. 94, The Levy Economics Institute of Bard College, New York.
Zakaria, F. (2008) "There is a silver lining," *Newsweek*, October 11.