Chapter 15 tackles the theory of inflation under modern fiat money. It opens with a reminder that the historical path from private money to state money is long and torturous. The state did not invent money, coins, payment obligations, or debts. Once money has been established the state is impelled to expand its base beyond compulsory payments in labor and in kind to payments in money. Governments have typically imposed poll taxes, property taxes, and taxes on commodities, import, exports, tolls, and harbors, and more recently, on income. In addition, they have resorted to sales of public lands, the ransom of prisoners, and seizures of foreign ships, goods, and treasuries. At some late stage in history the state monopolizes the creation of coins and tokens. This is merely a takeover of a previously private function, and private banks continue to create the vast bulk of the medium of circulation and medium of payment. The state also comes to exercise some degree of control over banks—a control whose intrinsic limitations are periodically exposed during recurrent financial crises. The general global crisis of the early twenty-first century is a stinging refutation of textbook fantasies of the Left and the Right, in which a wise and benevolent state supposedly controls money and finance for the common good. Fiat money, forced inconvertible token money, is the characteristic form of modern money. The history of money reminds us that private circulation gives rise to money tokens which are accepted as long as they are deemed able to perform certain functions as money and people accept inconvertible scrip for the same reason that they accept convertible scrip: because they believe that they can continue using them as money. While legal tender laws may be useful in establishing a currency, and legal restrictions on foreign currency and gold holding may impede recourse to alternatives, they cannot prevent private agents from seeking more secure monetary forms (chapter 5).

Section II provides a detailed survey of chartalist and neo-chartalist claims about money, beginning with the claims of Innes and Knapp who attribute great powers to the state and an extraordinary passivity to private agents. Keynes explicitly lauds Knapp for defining "State-Money" as anything which is accepted by the state, which means that gold coins, convertible tokens, and fiat money became State-Money when the state accepted them. This is perfectly consistent with the private invention and reinvention of monies to which the state periodically accedes. Unlike Knapp, Keynes only claims that the state invented fiat money. Neoclassical economics typically present money as a creature of the market and the state as an excrescence while Keynesian and post-Keynesians typically criticize the market and defend the state. Neo-Chartalists such Goodhart, Wray, and Bell fall in the latter camp, and their views along with those of critics such as Merhling and Rochon are examined in some detail. No one disputes that modern fiat money can be created to any degree. So if one strips away the Chartalist claims about the origins of money and the passivity of money holders, their central argument becomes that under modern fiat money regimes government deficits in service of social programs need not cause inflation or raise interest rates.

Section III focuses on the effects and limits of fiat money. It frees the state from its direct budget constraint. It successfully fueled the American, French, Chinese, and other revolutions. And it has led to hyperinflation at various times in history (section VIII.4). As a result, the Treasuries of most advanced countries face legal prohibitions against directly creating money to finance deficits. The Treasury can only spend money available in its account which is replenished through the tax inflow, some part of which is a reflux, and through borrowing from (selling bonds to) the domestic

public or to foreigners. But the modern central bank can create any mandated sum at the stroke of a key and transfer it to the Treasury by buying the latter's newly issued bonds. Then the only restraint on this process would appear to be from the resistance of the central bankers and from a benighted view about the piling up of the government debt to itself—were it not for the possible effects on prices and interest rates. This is where the core neo-Chartalist propositions come back into the picture. As Keynesians, they believe that involuntary unemployment can be eliminated by deficit spending (as opposed to the classical view in chapter 14 that it cannot), and as post-Keynesians, they believe that the exchange rate can be set by the state at any desired level and that the price level is determined by monopoly markups ultimately resting on the money wage. On this basis, they propose a government (Employer of Last Resort, ELR) program to employ at some fixed money wage any labor that the private sector is unable to absorb. The base wage rate would then provide a stable anchor for all other wages and, through stable markups, also all prices. Undesired effects of international interest rates on domestic ones could be negated through appropriate manipulation of the exchange rate. Undesired domestic income and interest rate effects could be avoided by having the state raise taxes in order to rein private spending and sell bonds to the public or foreigners so as to reduce the money supply. The neo-Chartalist core argument rests on several crucial propositions none of which obtain in the classical argument: (1) that unemployment can indeed be held at any desired level (chapter 14); (2) that the private sector money wage is determined by the base ELR wage, rather than through the ongoing struggles between workers and their bosses (chapters 4, 14); (3) that the price level is determined by the money wage in the private sector because of monopoly markup pricing (chapter 12, sections V–VI); (4) that the state can maintain the whole spectrum of bond rates at desired levels by fixing the base rate (chapter 10); and (5) that it can fix the nominal exchange rate at any desired level (chapter 11). The issue in each case is not about whether the state can carry out the prescribed acts but rather about their possible consequences, of which inflation is one.

Section IV constructs a classical theory of inflation. Competition only establishes relative prices through the equalization of profit rates. Under pure fiat money the price level is determined by aggregate demand and supply rather than the relative price of some money commodity. The growth in aggregate demand is fueled by new purchasing power (chapter 13, section III.3) and a modern credit system based on fiat money can fuel virtually unlimited growth in aggregate demand (chapter 5, section II.4). Then the limits to the growth of supply become crucial. It has already been established that the supply of labor cannot play this function because the system reverts to a persistent rate of unemployment (chapter 14, sections III–IV). The limit arises instead from the fact that no economy can sustain a rate of accumulation greater than that determined by the full reinvestment of the economic surplus (i.e., greater than the rate of profit). This is implicit in Ricardo's corn-corn model and Marx's Schemes of Expanding Reproduction and is explicit in Kaldor and von Neumann. The degree to which the actual rate of accumulation approaches its limiting value can therefore be viewed as a measure of the degree to which the maximum growth potential of the economy is being utilized—a "growth-utilization" index. The basic model is therefore one of demand-pull from newly created purchasing power and supply resistance from a tightening growth-utilization index. Since the profit rate is the ratio of profit to capital and the rate of accumulation is the ratio of investment to capital, the growth utilization index is simply the share of investment in profit. The section ends with a discussion of the appropriate measurement of real average and incremental rates of profit which play a key role in the empirical analysis of section VIII.

Section V analyzes the demand-pull side. It was established in chapter 12 that aggregate excess demand in the commodity market can be expressed as three sectoral balances: ED = (I–S) + (G–T) + (EX – IM). Once we consolidate inter-sectoral balances this leaves the portion of net new domestic credit from private and central banks and private businesses which goes into the purchases on new goods and services (as opposed into purchases of financial assets and existing homes, valuable objects, etc.), plus the current account balance (CA) of the trade sector and any part of net borrowing from abroad that fuels domestic commodity purchases. Over the interval in which demand and supply roughly balance, an increase in commodity purchasing power will manifest itself in additional production and/or price increases, that is, in an increase in nominal gross output (defined in the sense of Leontief). Then the growth rate of nominal GDP will be some function of new purchasing power relative to GDP. This is consistent with both monetarist and Keynesian approaches. Section VI develops the supply-resistance side of the argument. The key point is that the response of real output growth becomes increasingly muted as the actual growth rate approaches the maximum growth rate (the profit rate). This is similar to Keynes's notion that as full employment is approached, less of new demand is absorbed by new output and more by price increases. Marx makes a similar point in a growth context and Pasinetti provides a formal analysis of the increasing prevalence of bottlenecks as the actual rate of growth approaches the theoretical maximum rate. The growth-utilization index is the strain-gauge of growth.

Section VI combines the demand-pull and supply-side arguments into a classical theory of inflation. The classical argument implies that real output growth responds positively to net purchasing power and net profitability as measured by the net real incremental rate of profit (chapter 13, section III) and responds negatively to the degree of growth utilization at least when the latter rises above some critical level. It seems likely that the interactions will be nonlinear. The unutilized growth-utilization potential plays the same role in classical inflation theory as the unemployment rate does in standard inflation theory. Then since the rate of inflation is equal to the difference between the rate of growths of nominal and real output, and since the former is a function of new relative purchasing power, we can say that inflation responds positively to new relative purchasing power, negatively to net profitability, and negatively to unutilized growth-utilization potential. When new purchasing power is growing sufficiently to offset the negative impact of falling profitability, we would have a Phillips-type inflation curve in terms of unutilized growth potential. From this point of view, we could view net new purchasing power and net profitability as shift factors of this basic curve. It is particularly important to note that since growth depends on net profitability and new purchasing power, it is possible that a fall in the former can be mitigated by a rise in the latter so that the growth rate would fall less than the profit rate and their ratio, the growth-utilization rate, would rise. The fall in the growth rate would increase the unemployment rate while rise in the growth-utilization rate would make the economy more inflation-prone. This is the secret of the dread "stagflation" that led to the overthrow of Keynesian theory (chapter 12, sections III– IV). The net rate of profit and the growth-utilization rate can only vary within certain limits, but there is no such constraint on new purchasing power in a fiat money system. Hence, when the rate of creation of new purchasing power is relatively low, one would not expect any direct relation between it and inflation because the other factors would be decisive. But as newly created purchasing power gets larger and larger, one would expect such a relation to emerge, and at very high rates one would expect the rate of inflation to be roughly equal to the rate of new purchasing power. This is similar to the theoretically expected nonlinear relation between a country's relative inflation rate and its

nominal exchange previously derived in chapter 11, section VI. Finally, insofar as the net profit and the growth-utilization rates are positively correlated, it would be possible to treat the latter as a proxy for the former, which leads to a more restricted hypothesis in which inflation is a function of the growth-utilization rate in which the overall effect of the latter is ambiguous because growth-utilization and net profit rates have opposite influences on inflation.

Section VIII considers the empirical evidence, starting with the United States. The strong graphical and statistical relation between nominal GDP growth and new relative purchasing power is consistent with the classical hypothesis that the former is a function of the latter. The second key hypothesis is that the growth rate of real output responds to purchasing power, net profitability, and the growth-utilization rate. The appropriate measure of net profitability is the real net rate of return on new investment as proxied by the real net incremental rate of profit developed in chapter 6, section VII. Real output growth is strongly positively correlated with this real net return on net investment. The two preceding hypotheses imply that the rate of inflation is a function of relative new credit, net profitability, and the degree of unutilized growth capacity, the latter taking the place of the unemployment rate in conventional theory. Scatter plots of the inflation rate versus unutilized growth potential are compared to standard ones using the unemployment rate instead, for the whole postwar period 1951–2010 and for sub-periods 1951–1981 and 1982–2010. The differences are striking. In every case, the classical inflation "Phillips" curve displays a clear downward slope, whereas the conventional curve does not (as we already know from chapter 12, section III.5). Given that the net profit rate and new relative purchasing power act as shift factors in the classical inflation curve, the observed differences in the patterns exhibited in two sub-periods can be explained by the changes in the levels of those two variables.

Handfas tests my inflation hypothesis on seven OECD countries (Canada, France, Germany, Japan, South Korea, the United Kingdom, and the United States) and three developing ones (Brazil, Mexico, and South Africa), the latter being tentative because of small sample sizes. On the assumption that the net profit and the growth-utilization rates are positively correlated and that the latter is likely to have an inhibiting effect only when it reaches as sufficiently high level, he posits that there will exist a nonlinear long-run relation between inflation and net purchasing power and the growth-utilization rate. He tests this using an error-correction representation of an autoregressive distributed lag (ARDL) model from which he can estimate the longrun coefficients. In all OECD countries, the long-run relations are significant and have relatively good fits, but less so in Brazil and South Africa and are not satisfactory in Mexico. A striking result is that in all countries the coefficients of the nonlinear function of the growth-utilization rate have the expected signs suggesting a U-shaped functional form with a negative region for some values of the rate. The average rate of the United States puts it in the positive (inflationary region) of its estimated curve, but the rate in Japan falls with the negative (deflationary) region of its curve. As previously noted in the summary of section VI, the classical argument also implies that a direct relation between inflation and new purchasing power will only emerge when the latter is high. A 1988 study by Harberger covering twenty-nine countries over 1972–1988 exhibits exactly this property, as does an extended sample produced by Ramamurthy covering forty-six countries over 1988–2011. Argentina in 1982–1984 appears at the high end of Harberger's sample with an average inflation rate of 255% and an average growth of total credit of 312%, but even this is modest compared to Argentina in 1989 when inflation was 5,380%. Despite the absence of current account data, one can see

extremely strong relations between total (public and private) credit growth and nominal GDP growth, inflation, and currency depreciation. At their peaks, nominal GDP and the price level grow substantially less than total credit, which could be accounted for by purchasing power going into asset price inflation and into currency flight—both well-known phenomena in such circumstances. In addition, at the peak the exchange rate depreciates even faster than prices increase—as expected by the combination the equilibrium classical effect of inflation on exchange rates (chapter 11, section VI, and table 11.4) and currency flight.

Section XI concludes the chapter by comparing the classical hypothesis to the Non-Accelerating-Inflation-Rate-of-Unemployment (NAIRU) hypothesis which dominates modern discussions of inflation. The classical proposition can be expressed as the hypothesis that the level of inflation is a positive function of the extent to which the unutilized growth capacity falls below some critical rate, subject to shift factors stemming from net profitability and new purchasing power. The simplest form of the NAIRU hypothesis is that the change in inflation (the acceleration of the price level) is a positive function of the extent to which the unemployment rate is below the "natural rate of unemployment." Both hypotheses link inflation to departures from the critical values of their respective driving variables. In addition, both expect the system to return to some normal level of unemployment. However, in the classical case, this is a rate of involuntary unemployment not directly related to the inflation rate (chapter 14), whereas in the NAIRU it is in effect a full employment rate. From a classical perspective, it is possible to lower the normal rate of unemployment by reducing wages relative to productivity, either through neoliberal attacks that seek to lower the growth rate of real wages by weakening labor or through "Swedish" policies that stimulate productivity growth in excess of real wage growth (chapter 14, section VII). Furthermore, the critical growth-utilization rate is not an equilibrium rate because there is no presumption that the economy sticks at this rate, whereas under the NAIRU hypothesis the natural rate of unemployment is exactly the rate to which the economy returns in the absence of sustained efforts to prevent that. In the classical case, inflation can be zero as long as the growth-utilization rate and the rate of creation of new purchasing power are not too high. Inflation can even be negative (i.e., there can be deflation) under appropriate circumstances. In the classical case, the inflation rate is determinate but the corresponding price level will be path-dependent, while in the NAIRU case the rate of change of inflation is zero at the natural rate of unemployment, but the particular value of inflation will be path-dependent—precisely the basis for the policy conclusion that unemployment must be maintained above the natural rate of inflation rate for some time so that inflation can be "wrung out." In the NAIRU argument, hyperinflation comes about from persistent attempts by the state to maintain unemployment below the natural rate because this sets up an unstable expectational spiral. In the classical case, the proximate causes of inflation are an increase in the growth rate relative to the profit rate and/or an increase in the creation of new purchasing power, with hyperinflation arising only if the state takes the latter to extremes. Lastly, the classical theory of inflation is rooted in the operation of real competition, whereas the NAIRU hypothesis, like much of modern macroeconomics on both neoclassical and post-Keynesian sides, is typically based on imperfect competition.