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**THE ECONOMIC POLICY OF RONALD REAGAN.**  
**BETWEEN SUPPLY-SIDE AND KEYNESIANISM**

COSIMO MAGAZZINO \*

ABSTRACT: “Reaganomics” is a popular term used to refer to the economic policies of Ronald W. Reagan, the 40th U.S. President (1981-1989), which called for widespread tax cuts, decreased social spending, increased military spending, and the deregulation of domestic markets. In this paper, we analyze American economic policy during the Eighties. After a brief introduction, where a general economic context of that country is shown, we discuss and revise the economic literature about these issues. Afterwards, we present an augmented IS-LM model for Reagan years, estimated by VECM techniques, discussing the major econometric findings. Finally, we suggest some concluding remarks.

SUMMARY: 1. Introduction; 2. The analysis of economic policy during the Reagan Administration; 3. The augmented IS-LM model during the Reagan years; 4. Concluding remarks.

KEYWORDS: Reaganomics; Supply-Side Economics; Laffer curve; tax cuts; twin deficits; IS-LM model; VECM.

JEL Codes: A1; C2; H1; N4.

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## 1. – Introduction

THE AIM OF THIS ESSAY IS TO ANALYSE THE ECONOMIC POLICY OF REAGAN Administration. In general terms, Reagan pledged to return, or advance, to a free market and to “get government off our backs”. Specifically, Reagan called for a massive cut in government spending, an even more drastic cut in taxation (particularly the income tax), a balanced budget by 1984, and a return to the gold standard, where money was supplied by the market rather than by government. In addition to a call for free markets domestically, Reagan affirmed his deep commitment to freedom of international trade. We would like to discuss, in particular, the economic measures taken during the Reagan years, showing some comments and critics of literature, and suggesting some concluding remarks.

Economic policy in the 1980s may eventually become the most studied and hotly debated of any decade in United States history, even including the 1930s. Probably, the two books that represent the contrasting opinions about “Reaganomics” are Robert Bartley’s *The Seven Fat Years* (1988) – with its praise for the policies of the decade – and Paul Krugman’s *Peddling Prosperity* (1994), which contains an overall critic to the economic policy implemented during the Eighties.

Shortly after assuming the presidency, Ronald Reagan (1981) asserted that his proposed budget cuts for federal fiscal year 1982 were

*«only a first step toward reordering the relationship between citizen and government. [...] I know that accepting responsibility, especially for cutbacks, is not easy. But this package should be looked at by state and local government as a great step toward not only getting America moving again, but toward restructuring the power system which has led to economic stagnation and urban deterioration».*

Ronald Reagan’s advisors came to office with the intention of cutting both taxes and spending. But they soon found out that it was easier to achieve the first of these objectives than the second. The reason was simple: politics. It was popular to cut taxes. And taxes did come down substantially. The top marginal rate was reduced from 70 percent to 28 percent; the tax base was broadened; and many deductions and loopholes were eliminated. But it was unpopular to cut spending, and the Democratic Congress bridled at the extent of the cuts that the president proposed.

The paper is divided into four sections. Section 2 provides a survey of economic literature on this issue, discussing the most important features of Reagan’s economic policy. Section 3 presents an IS-LM model, augmented for the inflation. The model has been estimated for the Reagan period, with quarterly data. The results are quite interesting; in fact, in spite of the fact that one of the Reagan’s economic advisors was Milton Friedman, the “father” of Monetarist Revolution, the econometric analysis shows that during the Eighties the Keynesian model worked:

money is not neutral, having real effects. Finally, Section 4 presents our concluding remarks.

## **2. – The economic policy during the Reagan Administration**

As Yergin and Stanislaw (1998) pointed out, thanks to Volcker's efforts, monetary restraint was obtained quite early in the course of the Reagan administration. And Reagan's unwavering stance in the air traffic controllers' strike of 1981 helped change the tone of labor relations, indirectly contributing to the muting of inflationary psychology.

The Federal Reserve's adoption of a more monetarist approach to policy-making in 1979 changed the operating instrument of monetary policy, shifting it from interest rates to the monetary aggregates. This major shift in policy, which occurred in October 1979 and only two months after Volcker became Chairman of the Fed, marked the beginning of the disinflation effort.

Because spending did not come down with taxes – and indeed defense spending went up sharply – and because the tax cuts did not feed back into the economy to the extent hoped, both the federal debt and the annual deficit ballooned; and in 1981-'82, the economy was in a deep recession.

By the end of Reagan's first term, the Supply-Side logic was discredited in the eyes of many, and the inability to bring taxes and spending down together stood in marked contrast to Volcker's victory over inflation.

Between the beginning and the end of the Reagan presidency, the annual deficit almost tripled. So did the gross national debt – from \$995 billion to \$2.9 trillion. This is what Stockman (1996) defined as “the fiscal error”.

The main purpose and justification for the tax reform of 1981 was to encourage saving by increasing returns through reduced taxation on property income (along with reduced taxation on other incomes) and to encourage investment through various tax incentives. Keynesians tend to be highly skeptical of this approach. At least in a closed economy, incentives to invest will not increase investment unless saving also rises. There are two ways saving can rise. The first is through higher employment and income. This path however was largely closed to the Reagan.

If the decline in inflation is the most frequently mentioned gain from the economic policy of the 1980s, the most frequently mentioned criticism was the increase in the budget deficit. The full employment deficit rose as a share of GDP by 1.1 percentage points, from 1.6 per-cent of GDP on average in the 1970s to 2.7 percent of GDP on average in the 1980s. Put in these terms the increase in the

budget deficit in the 1980s seems considerably less dramatic than conventional wisdom would have it: more than half was inherited from the 1970s. To be sure, as Poterba points out, the deficit should be measured in real terms, and with the decline in inflation in the 1980s the real deficit was higher for any given nominal deficit.

Noll and Joskow (1981) argued that economic deregulation began in 1975 and was almost complete by the time Reagan became president, though the Reagan Administration prevented re-regulation.

Horwich (1982) underlined as the Reaganite interpretation of American economic history stressed the role of the individual in a decentralized decision-making process. To the extent that property rights are secure, people and capital will be mobile, individuals will invest their savings, and the masses will emerge from poverty on a grand scale. But government, of course, did play a crucial role in setting and enforcing the laws of a free society, including the ground rules for economic transactions. This includes the preservation of competition and the internalization of externalities.

Viscusi (1982), who criticized Reagan administration on regulation and cost-benefit analysis, wrote:

*«A major failure of the Reagan regulatory reform effort is not just that such reforms were never achieved but that they were never attempted».*

Zinam (1982), in order to place Reaganomics in its proper perspective, identified two major aspects of it. One dealt with its basic economic philosophy, the other with some long-range structural changes which need remedial action. Philosophically, Reaganomics was identified with individualism and libertarianism: economic decisions had to be left to individuals and enterprises, since they knew best what was good for them, while government should have been limited only to those economic decisions which the former could not make for themselves. So, it was important shrank from over-regulating and over-controlling government. In Zinam's opinion, Reaganomics was neither an attempt to return to *laissez-faire*, nor did it provide a short-run fix to improve economic performance. It did not represent a fully developed and integrated theory nor a new paradigm, but rather a point of view, a basic economic philosophy dealing with a general direction in which the economy was moving.

Bartlett (1982) divided conservative critics of Reagan administration's economic policies into three general categories: a) conservative Keynesians; b) "Rational Expectations School"; c) libertarians and "Austrian School". In particular, each group saw the budget deficit as the most serious economic problem that US had in the 1980s.

The conservative Keynesians started with a demand-side approach: so, they believed that government influenced the economy primarily through the control of

aggregate demand, and aggregate demand was increased when the budget deficit increased. Yet, they didn't sufficiently distinguish between a budget deficit caused by an increase in government spending or by a reduction in government revenue – but they tended to prefer the former solution. On the contrary, for supply-siders economists it made a tremendous difference whether a budget deficit resulted from an increasing in spending or a tax cut. When spending is increased, the government is preempting more goods and services from the private sector, causing a “crowding-out effect” and higher interest rates. However, when tax rates are cut, the government is not expropriating more goods and services. Bartlett singled out six reasons for which tax cuts were preferable than higher public spending. First, tax rate reduction create revenues feed-back; secondly, a tax rate reduction will cause the so-called underground economy to shrink, and it will somewhat reduce the incentive to hide income from the tax collector, thereby producing some revenues. Third, there will be a reduction in tax-sheltered investments and this will produce a revenue reflow. Fourth, a tax rate reduction will reduce incentives for nonproductive investments in such things as gold, paintings, rare stamps and antiques. Fifth, a tax cut will produce an increase in savings. Lastly, a tax cut will produce some automatic spending cuts as well.

Rational Expectationists moved from the argument that deficits were inflationary. As Miller (1980) stated

*«When bonds are almost identical to money, any change in policy that increases the deficit is inflationary».*

Lucas (1981), instead, took the more conventional view that deficits, however they are caused, put pressure on the Fed to monetize the debt, thereby causing inflation.

Miller and Struthers (1980) argued:

*«Federal bonds are nothing more than an alternative form of currency – they are promises to deliver currency in the future. Like currency, these bonds are pieces of paper backed by nothing tangible; they are flat paper. Like currency they are a debt that the government never promises to retire. They are, in all essentials, a part of our ever-expanding money supply».*

Bartlett (1982) criticized these assumptions, because he reputed that there were essential differences between the government's bond and currency. In fact, bonds imply a stream of future interest payments, that will be financed either by future taxes or by additional deficits.

Austrian School critics of Supply-Side Economics concerned increasing deficit spending. According Austrian economists, Supply-Side Economics and his “Laffer curve” was another way of increasing government revenues. As Cowen (1980)

argued:

*«The most serious drawback of the Laffer curve is that it may be used for the purpose of maximizing government revenue».*

And Ebeling (1980) wrote:

*«The infighting and emotional hysteria in Congress over the Kemp-Roth Bill is nothing more than the politicians and the special interests arguing over whether the proposed tax cut will or will not supply the government with ever greater sums to dole out to friends and favorites of the political court».*

Anderson (1980) considered Supply-Side Economics as the just obverse of Keynesianism, substituting government control of supply for control of aggregate demand. Sennholz (1980) wrote on this argument:

*«Some of these supply-side advocates want merely to substitute the collectivist Keynesian blueprint with their own, and replace the demand-side tinkers in Washington with a new team of collectivist supply-side tinkers».*

Danziger (1983) showed that Reagan transfer programs significantly reduced poverty, but that welfare accounts for only a small proportion of this reduction. He underlined that non-whites were not more likely to be dependent on cash transfers than whites, but that they were more likely to be dependent on welfare. Increased welfare, however, cannot reduce poverty, increase work effort, and contain the welfare rolls. President Reagan's welfare reform reduced the "Aid to Families with Dependent Children" (AFDC) case loads and increased poverty for many welfare recipients who were mixing work and welfare. The Reagan program assumed that those who remain poor will be better off waiting for economic growth to trickle down from those above them rather than relying on welfare and public jobs programs.

Buchanan (1985) suggested that there was nothing particularly new or deplorable about Reagan's deficit because in any democratic government the budget-making process has a built-in bias toward deficit.

Marris (1985) suggested that paradoxically, "Reaganomics" has, by now, created the potential for a "Reagan miracle" in Europe and Japan of the kind enjoyed by the United States in the period 1983-84. These nations could give themselves a fairly large dose of fiscal expansion and set off a strong rise in domestic demand, while inflation would be held down because their currencies would be appreciating, and budget deficits would not crowd out investment because their savings would (ex ante) be flowing back from the United States.

Poterba's paper (1987) showed that tax receipts as a share of GDP remained

roughly constant during the 1980s equaling 18.9 per-cent of GDP in 1979 and 19.2 percent of GDP in 1989. So, the increase in the deficit during this period was due to spending in-creases, rather than to tax decreases.

As Modigliani (1988) stated, beginning with 1979 and up to 1982, a case can be made that the Fed was adhering to a monetarist course. Furthermore, during these years the M1 growth target did tend to decline gradually. But even during this period there are many aspects of the Fed's behavior that cannot be reconciled with monetarism and instead fit the hypothesis of GNP targeting. Moreover, throughout the years 1979-82, the actual growth of M1 exceeded the target growth, except for 1981.

Considering the fiscal policy, according Modigliani (1988) the deficit resulted from the large personal and business tax cuts which Reagan pushed through Congress, particularly the so-called "Kemp-Roth Act" of August 1981. The measure was designed to cut personal income tax rates by roughly one-quarter over a three-year period.

The central features of the 1981 Economic Recovery and Tax Act (ERTA) and 1982 Tax Equity and Fiscal Responsibility Act (TEFRA) were to: 1) Phase in reduction of marginal personal rates (including bracket indexing by 1985); 2) Reduce the top-bracket rate of 70 percent on investment income to 50 percent; 3) Adopt the Accelerated Cost Recovery System (ACRS) and extend the investment tax credit (ITC); 4) Adopt universal Individual Retirement Accounts (IRAs); 5) Implement the incremental Research and Development Tax Credit.

The 1986 tax reform was extremely complex. Its most important features were: 1) Lowering personal and corporate income tax rates (to a maximum of 28 percent and 34 percent, respectively); 2) A substantial shift (amounting to about \$120 billion over the next five years) of the tax burden from the individual to the corporate tax; 3) Elimination of the investment tax credit (a feature common to all the major reform proposals); 4) Much slower depreciation schedules; 5) Stiff alternative minimum tax for corporations. (to insure that no corporation that reports current profits to its shareholders will avoid paying taxes);<sup>16</sup> 6) The tax deductibility of Individual Retirement Accounts (IRAs) will be income-tested, and other tax-deferred retirement accounts (like 401(k) plans) will limit the amounts that individuals can contribute; 7) Capital gains will be taxed in full as ordinary income, with no inflation adjustment for the basis of the asset; 8) Extension of the research and development (R&D) tax credit to December 1988 with tightened eligibility and a reduction in the rate from 25 percent to 20 percent; 9) Elimination of tax deductibility of consumer debt; 10) Various other changes in accounting rules, industry-specific items, and the personal tax base (for example, state and local sales taxes will no longer be deductible, the personal exemption is increased, and income averaging is eliminated).

Modigliani suggested a suggestive interpretation of fiscal policy results: Reagan was pretty successful in achieving one part of his economic program Supply Side



Economics-cutting taxes, and offsetting the loss of revenue by cutting non-defense expenditure. Both declined by somewhat over 10 percent-an impressive accomplishment considering the rising trend of earlier years in expenditure and personal taxes. Unfortunately this part of the program collided with another-the ambitious major escalation of defense outlays which, despite much opposition, resulted in a 20 percent rise in the GNP share of defense. This program Reagan left unfunded, being unwilling to accept higher taxes as a way to pay and unwilling and/or unable to cut non-defense any more deeply against a divided Congress. Because the rise in defense was unfunded it gradually increased the debt and thus the interest on the debt.

So, Modigliani concluded that of the many goals that the Reagan Administration had set for itself, only one was achieved reasonably closely, that of wringing inflation out of the economy. This was unquestionably a significant success, both because it fulfilled a commitment and because unaccustomed inflation, once it approaches the two-digit range, has numerous and non-negligible cost. One other target that the Administration has at least partly achieved is retrenchment in non-defense, non-Social security expenditures. This achievement is significant especially when compared with the earlier rising trend. But it was largely accomplished by means of tax cutting and the pressure of a mounting deficit.

Boskin (1988) wrote that the 1981 tax cuts were implemented at the beginning of a substantial disinflation. Since it was clear a recession would result, it was unreasonable to expect an investment boom as demand fell, inventories accumulated, and capacity utilization rates plummeted. Some concluded from this that the "Supply-Side" tax cuts had failed, a conclusion which is no more justified than the counter assertion that the investment boomlet of 1983-84 was due entirely to the tax changes. Nevertheless, the tax changes did play an important role, as the investment boom occurred even in the face of inordinately high real interest rates over the period. He concluded:

*«The lesson of the 1980s is not that we should dramatically change the new tax laws but rather that we should build on their accomplishments: broaden the tax base to include more consumption while preserving low marginal tax rates and restoring carefully targeted incentives for saving and investment».*

Sachs (1988) pointed out the relation between fiscal deficit and external deficit of the country, calculating that an increase of a 1.0% in the fiscal deficit meant a deterioration of the current account balance of 0.66%. Other studies also found that shifts in U.S. and foreign fiscal policies accounted for over half of the widening of the U.S. external deficit.

Smyth and Dua (1988) estimated the public's indifference map between inflation and unemployment by an econometric analysis of an index of the public's rating of President Reagan's macroeconomic policy. The indifference map obtained

was markedly nonlinear so that the public's trade-off between inflation and unemployment varied greatly with the relative rates of inflation and unemployment. A particular change in inflation or unemployment changed the President's rating much more when inflation and unemployment were high than when they were low. If the unemployment rate was close to its natural level, there was little incentive for a President to force down inflation to a rate close to zero.

Tabellini and La Via (1989) moved from two central findings: 1) during the period 1955-1985 the burden of stabilizing public debt fell exclusively on the fiscal authority; 2) Democratic administrations have systematically pursued more expansionary fiscal and monetary policies than Republican administrations. Their paper estimated the monetary policy reaction function jointly with the fiscal policy reaction function and with the law of motion of public debt. These estimates revealed the policymakers' attitudes towards the goal of stabilizing the path of public debt. The results shown that in the U.S. during the years 1955-'85 this goal had been pursued by the fiscal authority but not by the central bank. Hence, monetary policy, and not fiscal policy, seemed to be dominant in U.S. regime of that period. Moreover, the empirical evidence suggested that monetary and fiscal policy were influenced by political variables: so Democratic administrations had systematically pursued more expansionary policies than Republican administrations.

Considering the inflation problem, President Reagan (1981) explained:

*«above all bringing government spending back within government revenues, which is the only way, together with increased productivity, that we can reduce and, yes, eliminate inflation».*

Orzechowski (1989) searched to demonstrate that a collective rebate can be an effective tool to reduce excessive government. The idea was that the general public can be aroused to vote for and support political agendas that reduce government intervention. Bunching many pro-competitive policies in one package (a collective rebate) offered an opportunity to turn the public against the special interests.

An attempt was made to extend the collective rebate principle to the fiscal policy employed by the Regan administration. With all of its faults notwithstanding, it was shown that this fiscal policy could be interpreted as a successful application of the collective rebate principle.

Throop (1991) moved from the point that the national debt nearly tripled during the Reagan Administration. One widely held view is that the extra spending that was financed by the issuance of federal debt during the Reagan years was generally used for consumption, rather than investment, and as a result a burden was placed on future generations. This burden takes the form of a lower capital stock, and therefore lower production and incomes in the future, to the extent that the expenditures that were financed by the debt issue "crowded out" private

capital formation. Alternatively, it takes the form of increased indebtedness to foreigners (without an offsetting increase in the economy's capital stock) to the extent that inflows were attracted from abroad. In this case, the economy's capital stock, and hence production and incomes in the future, are not reduced, but the economy's absorption of future output must decline in order to service the debt to foreigners. An alternative view of the reason for rising indebtedness to foreigners during the Reagan years is that investment opportunities in the U.S. improved, not only because of the tax cuts for business but also as a result of deregulation and a reduced risk of government intervention. Testing a macro-econometric model for the "Barro-Ricardo Equivalence", Throop found out that the errors in the consumption function during the Reagan years were not atypically large, and they appear to be more closely related to the business cycle than to a Ricardian response to budget deficits. The total economic burden that fiscal policy in the Reagan years placed on future generations is estimated as equivalent to either a lump sum payment equal to 9 percent of the nation's current GNP or an annual payment equal to 0.4 percent.

Aguado (1992) underlined several reasons why the economic growth wasn't as high as it was expected, and didn't surpass the results of other recent periods of economy expansion in the United States. One of them has to do with the low rate of productivity growth in the country; another, with the process of deindustrialization taking place in the United States in those years. It can be said that both reasons are interdependent, as the US is becoming more and more a country specialized in Services whose rate of productivity growth is very low.

Moreover, Aguado explained U.S. growth rate during the '80s emphasizing the role of savings and investments. Concerning the individual savings rate, the United States citizens saved, in 1980, 7.1% of their disposable income and, in 1987, they only saved 3.8%. This decrease in family savings added to the "dissaving" of the public sector made national savings, that decrease from 16.2% of the GNP in 1980 to only 12.4% of the GNP in 1986. The OECD, in fact, designated in 1986 the United States as the country with the lowest national saving rate among the 24 countries that constitute the organization.

When studying the behavior of net investment, we see that an important deterioration has taken place: during the fifties net investment as a percent of GNP was 7.0%; during the sixties the figure was 7.1%; during the seventies, 6.7% and during the eighties the figure dropped to the level of 4.7%. A reason for this could be the increased depreciation of the existing stock of capital in 1980s, probably because this became of shorter duration; another possible explanation concerns the high real interest rates of the country's recent history.

Finally, considering the inequality problems, Aguado stated:

*«Another subject to be discussed [...] is that related to income distribution. Different data on this issue show a deteriorating situation that probably began in the mid 70's and*

*worsened during the eighties. During the Reagan presidency seems to have been true the slogan used by Governor Dukakis in his electoral campaign, that the rich had become richer, the poor poorer and the middle class was squeezed in between».*

According to Feldstein (1994), President Reagan either hoped that the deficit would decline as the economy grew or else thought that spending cuts would eventually be made. Hence, an increase in taxes as a share of GDP was not viewed as either necessary or desirable. Feldstein also argued that the supply side argument that tax cuts would pay for themselves was a factor in the optimism.

Feldstein argued that the effort to stabilize exchange rates under the “Plaza Agreement” interfered with domestic monetary policy in Japan and the United States, and it also led to policies in the United States which were too tight.

The analysis by Martin Anderson in *Revolution* (1988), his memoir on Reagan’s economic policy, took a different view from that of Feldstein.

From a libertarian perspective, Rothbard (1994) strongly criticized Reagan economic policies and the “Myths of Reaganomics”. In cutting government expenditure, in 1980, the last year of free-spending Jimmy Carter the federal government spent \$591 billion. In 1986, the last recorded year of the Reagan Administration, the federal government spent \$990 billion, an increase of 68%. A better comparison would be percentage of federal spending to net private product, that is, production of the private sector. That percentage was 31.1% in 1980, and 34.3% in 1986. So even using percentages, the Reagan Administration has brought us a substantial increase in government spending. Moreover, in Rothbard’s opinion there was never much difference between Reagan’s and Congress’s budgets. So, the result of this failure has to impute to the President’s measures.

But, for Rothbard, the most embarrassing failure of Reaganomics goals is the public deficit. Jimmy Carter habitually ran deficits of \$40-50 billion and, by the end, up to \$74 billion; but by 1984, when Reagan had promised to achieve a balanced budget, the deficit had settled down comfortably to about \$200 billion. This was by far the largest budget deficit in American history (probably overcame by the Obama’s one).

Also the tax cuts of 1981 were attacked by Rothbard. It’s true that tax rates for higher-income brackets were cut; but for the average person, taxes rose, rather than declined.

As a conclusion, Rothbard described referring to monetary and fiscal policy, the Democrats as the classic party of *liberal* Keynesianism, in contrast to the Republican policy of *conservative* Keynesianism, with little differences between them.

As Taylor (1995) pointed out, one could also say increased taxes were not raised to cover the increased spending on defense and entitlement programs. Thus, whether lower taxes or higher spending “caused” the deficit depends on your perspective. Another crucial point concerns the possible role played by “Barro-Ricardo Equivalence Theorem” in this question. In the Taylor’s view, there

was an overriding desire on the part of Reagan to keep tax receipts from rising as a share of GDP. With the absence of the 1981 tax cuts it would have failed in this goal.

Taylor explained that monetary policy in 1986 and 1987 in the United States was probably too easy on average rather than too tight. The boom in the United States in 1987 and 1988 got too far out of control; it eventually led to a typical boom-bust cycle.

Moreover, Volcker's comments on the "Plaza Agreement" are particularly interesting in that he claims the Accord had no implication for U.S. monetary policy either explicit or implicit.

Richardson gave a somewhat negative assessment of trade policy during the Reagan Administration:

*«U.S. trade policy in the 1980s seems on balance to have become mildly more restrictive» (Richardson, p. 655).*

Clearly, the expansion of voluntary restraint agreements increased congressional activism.

However, according to Taylor, the initiation of the Canadian-United States free trade agreement – though not the ideal multilateral approach – must on balance be considered a positive development. And the Uruguay Round started during the Reagan Administration was taken up with enthusiasm by both the Bush and the Clinton Administrations.

In his speech to a "Center of the American Experiment", Kudlow (1998) underlined as Reagan legacy was a living legacy. Its spirit, principles, and ideas were the dominant influence on both political parties, during the 1990s. He remembered the crucial importance of the Kemp-Roth tax cut bill, which later evolved down to the flat-tax reform of 1986. The top rate was reduced, in steps, from 70 percent to 28 percent, which spurred economic growth. The expansion of the 1980s lasted over seven years and created roughly 20 million new jobs. The economy grew at a 4 percent annual rate and the inflation rate was just over 3 percent. The unemployment rate was taken down from a peak of 11 percent to about 5.3 percent at its lowest point.

Moreover, Kudlow suggested how the "Laffer curve" goody worked – as the dynamic of real revenues showed –, and he also underlined a strategic use of debt. In addition, Kudlow remarked that an unintended aspect of Reagan's policies was the extraordinary explosion of this information-age high technology that has become the backbone of the economy in the 1990s. It started really in the mid- to late 1970s, but so many of the new computing devices, both hardware and software, that were developed in the 1970s were not sufficiently commercialized, brought to market, and distributed until the 1980s.

According to Médaille (2007), the properly name that we should give to Rea-

gan economic policies had to evaluate four goals of his administration. First, government spending: whether in absolute terms or in percentages, the Reagan administration had brought us a substantial increase in government spending. Second, taxes: despite the much touted tax cuts of 1981, taxes for the average person actually rose, and they rose every year thereafter. Of course, they weren't called "tax increases", they were instead called "fees" or "plugging loopholes"; but the effect was the same. Third, balanced budgets: in 1980, the debt of the United States was \$712 billion; when Reagan left office, it was over \$2 trillion; when the elder G. Bush left office, it was \$3 trillion. This kind of borrowing was also a tax increase, but an increase on future generations; Americans spend ourselves into prosperity by taking the money from their children. Fourth, government regulation: the Reagan administration took credit for the deregulation of the airline and trucking industries, but in fact this happened, or were begun, under the Carter administration. All that extra money the Reagan Administration was spending went, in fact, to a larger and more intrusive government.

As the Table 1 below shows, during the period 1981-1988 investment, government and consumption share of real GDP per capita remained substantially constant, with moderate fluctuations. The total expenditure of general government (measured as percentage of GDP) rose of 1.7% from 1981 to 1988, especially due to the increase of defense spending.

*Tab. 1 – Some Macroeconomic Fundamentals during the Reagan years (U.S.A., 1980-1990).*

<b>Year</b>	<b>Investment share <sup>a</sup></b>	<b>Government share <sup>b</sup></b>	<b>Consumption share <sup>c</sup></b>	<b>Government expenditure <sup>d</sup></b>	<b>Public debt <sup>e</sup></b>	<b>Misery Index <sup>f</sup></b>
<b>1980</b>	22.00	11.05	66.83	34.2	43.9	20.608
<b>1981</b>	23.04	10.92	66.01	34.5	41.5	17.915
<b>1982</b>	20.46	11.51	68.40	36.9	46.4	15.861
<b>1983</b>	21.14	11.33	68.79	37.1	49.5	12.813
<b>1984</b>	24.64	10.75	66.85	36.1	51.2	11.816
<b>1985</b>	23.90	10.95	67.63	36.8	56.1	10.761
<b>1986</b>	23.27	11.20	68.18	37.3	59.5	8.859
<b>1987</b>	23.10	11.14	68.21	37.1	61.3	9.941
<b>1988</b>	22.60	10.90	68.25	36.2	62.3	9.509
<b>1989</b>	22.88	10.67	67.76	36.2	62.6	10.127
<b>1990</b>	22.10	10.77	68.07	37.2	64.3	10.898

*Notes:* *a:* Investment Share of Real GDP per capita; *b:* Government Share of Real GDP per capita; *c:* Consumption Share of Real GDP per capita; *d:* Total Expenditure General Government,% GDP; *e:* General Government Consolidate Public Debt,% GDP; *f:* Sum of Consumer price index and Unemployment rate.

*Sources:* Penn World Table (PWT 6.3) data, <http://pwt.econ.upenn.edu/index.html>, and FRED database, <http://research.stlouisfed.org/fred2/>.

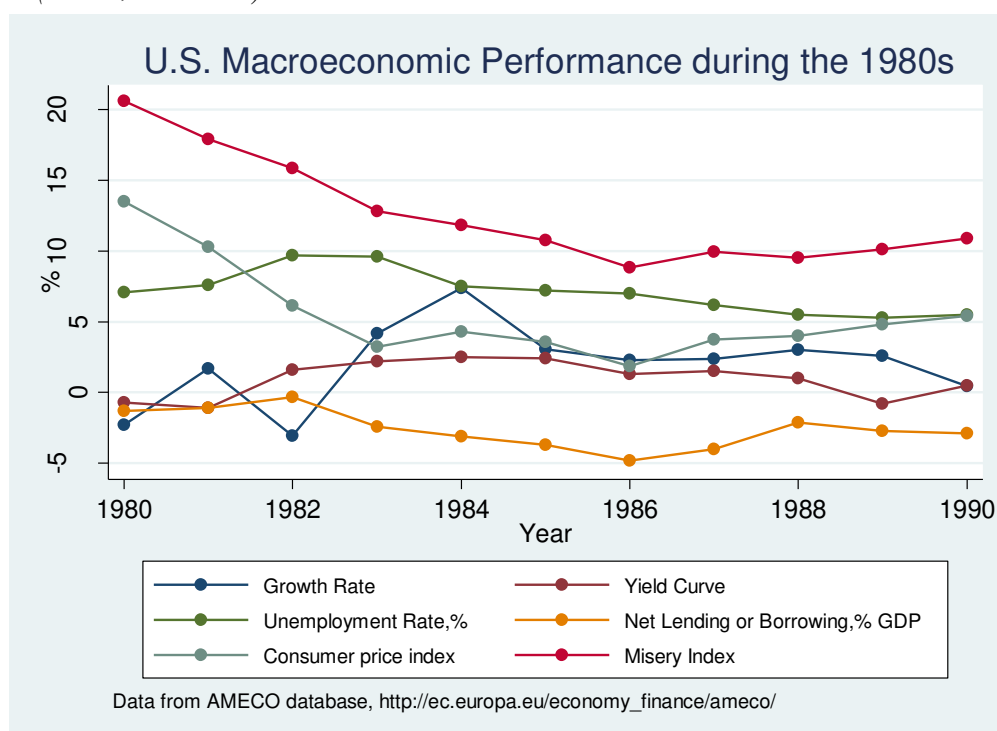
Instead, the public debt increased by 20.8 percentage point; yet, as the dynamic of public expenditure clarifies, the explosion of debt was a result of the deteriora-

tion of public revenue rather than the increase of public spending.

Finally, Misery Index declined constantly during Reagan administration, from 17.92% to 9.51%, with a sharp reduction in comparison to the Seventies.

Moreover, the Figure 1 presented below suggests that the yield curve fluctuated more or less about 2%, after a strong increase in 1981, while the growth rate, after a sharp decline in 1982, boomed in 1983-'84, and after that it increased by 2.5-3 percentage point. The unemployment rate dynamic reflected the overall economic conditions, showing an increase during the period 1981-'83, after which it permanently declined.

Fig. 1 – Growth rate, Unemployment, Interests rate and Trade Balance during the 1980s (U.S.A., 1980-1990).



Source: our elaborations on FRED data.

As we can notice, in 1980 growth rate and yield curve were negative, the unemployment rate and government share were over their 1988 values, while investment share was under its 1988 value. During the first two years of G. Bush Sr. administration, growth rate, investment share, government share and consumption share decreased in respect to 1988, whereas government expenditure and public debt heightened.

### 3. – The augmented IS-LM model during the Reagan years

In this section we discuss a simple IS-LM model augmented for inflation, during the Reagan years. The data has been derived from FRED database, by Federal Reserve Bank of St. Louis. All series contains quarterly data, from 1981q1 to 1989q1.

In Table 2 variables of the model are summed up.

Tab. 2 – List of variables used in our IS-LM model.

<i>Variable</i>	<i>Explanation</i>
<b>R</b>	Interest Rate - 3 months Treasury-Bill
<b>M</b>	M2, mld \$
<b>P</b>	GDP Price Deflator, 1987=100
<b>Y</b>	Real GDP at constant price (1987=100), mld \$

Sources: FRED database.

In Table 3 some preliminary descriptive statistics are shown.

Tab. 3 – Exploratory data analysis.

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Standard Deviation</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Range</i>
<b>R</b>	8.5827	8.1067	2.7819	0.9888	3.0946	9.7
<b>M</b>	2403.681	2421.3	458.5094	-0.0785	1.7035	1430.93
<b>P</b>	0.9244	0.9333	0.0838	-0.1375	2.0333	0.3039
<b>Y</b>	4218.888	4221.8	344.8901	0.1150	1.7358	1063.2

Sources: our calculations.

Initial assessment of the relationships among these four variables in U.S.A. suggests that developments in output growth, money supply and price deflator patterns are strongly correlated. Correlation coefficients summarized in Table 4 indicate a strong positive correlation between money supply and price deflator, as for money supply and real GDP, and price deflator and real GDP, too. These findings indicate that higher values of economic growth are associated either with higher values of money supply or price deflator.

Tab. 4 – Correlation matrix.

	<b>R</b>	<b>M</b>	<b>P</b>	<b>Y</b>
<b>R</b>	1	-0.8277	-0.8192	-0.7020
<b>M</b>	-0.8277	1	0.9933	0.9748
<b>P</b>	-0.8192	0.9933	1	0.9641
<b>Y</b>	-0.7020	0.9748	0.9641	1

Notes: Bonferroni adjustment applied.

Sources: our calculations.

Economists sometimes called these models as RMPY, due to the name of va-



riables included in it. Above all, we obtained log transformation of the series. Then, we applied time-series techniques on stationarity and unit root process, in order to check some stationarity properties. Table 5 contains results of common unit root tests, for all variables.

Tab. 5 – Results for stationarity tests.

Variable	Stationarity tests				
	Deterministic component	ADF	ERS	PP	KPSS
<b>R</b>	constant	NS: -1.047	NS: -1.299	NS: -1.935	NS: 0.192
<b><math>\Delta R</math></b>	constant	DS: -3.949	DS: -2.170	DS: -3.934	DS: 0.337
<b>M</b>	constant, trend	TS: -3.835	NS: -0.344	TS: -3.467	NS: 0.389
<b><math>\Delta M</math></b>	constant, trend	DS: -3.342	DS: -4.044	DS: -3.052	DS: 0.066
<b>P</b>	constant, trend	TS: -5.177	NS: -1.587	TS: -4.897	NS: 0.242
<b><math>\Delta P</math></b>	constant	DS: -2.895	NS: -1.067	DS: -2.739	NS: 0.637
<b>Y</b>	constant, trend	TS: -5.423	TS: -6.274	NS: -2.916	NS: 0.101
<b><math>\Delta Y</math></b>	constant	DS: -3.339	DS: -2.026	DS: -3.302	NS: 0.464

Notes: NS: Non Stationary; TS: Trend Stationary; DS: Difference Stationary.

Source: our calculations.

The second column presents results for Augmented Dickey and Fuller (1979) test; the third one for Elliott, Rothenberg and Stock (1992) test; the fourth column contains results for Phillips and Perron (1988) test; at last, in the fifth column there are results for Kwiatkowski, Phillips, Schmidt and Shin (1992) test. Interest rate (*R*) seems to be clearly non stationary, while for money supply (*M*) and price levels (*P*) we obtained ambiguous results; in fact, for two out of four tests these variables are trend-stationary (ADF and PP), while according to the remaining tests they are non stationary. Analogous results we reached for the output (*Y*). It should be noted, however, that non-parametric tests seem to suggest that GDP price deflator is a I(2) variable.

The lag-order selection has been conducted with the following statistics: final prediction error (FPE), Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC). They all selected a model with three lags.

Cointegration tests has been subsequently applied, in order to be able to find the long-run relationship among the variables. As is shown in Table 6, Johansen and Juselius (1990) cointegration method suggests that there might be two cointegrating relationships among variables. In fact, the trace statistic and the maximum-eigenvalue statistic reject  $r=1$  in favour of  $r=2$  at the 5% critical value. As in the lag-length selection problem, choosing the number of cointegrating equations that minimizes either the SBIC or the HQIC provides a consistent estimator of the number of cointegrating equations. Yet, both these criteria suggest a rank=2 for our data.

Tab. 6 – Results for cointegration tests.

<b>Johansen and Juselius procedure</b>		
Rank = 2	Rank = 2	Rank = 2
Trace statistic: 9.9551	Maximum-eigenvalue statistic: 9.4951	SBIC: -24.4145
5% Critical Value: 15.41	5% Critical Value: 14.07	HQIC: -25.9392
Log-Likelihood: 447.8458		AIC: -26.6564

Source: our calculations.

Equations 1 and 2 sum up the two cointegrating relationships.

$\ln R = -19.5598 \ln P + 1.9653 \ln Y + 1.740 t - 22.2230$ (3.0259) (0.7474) (0.0334) (0.0000)	(1)
$\ln M = 1.0975 \ln P - 1.1128 \ln Y - 0.0179 t + 1.7847$ (0.4907) (0.2833) (0.0054) (0.0000)	(2)

The VEC(2) model produces the estimates shown in Table 7 below.

Tab. 7 – Results for VECM(2) estimates for a RMPY model (USA).

	<b>Dep. var.: <math>\Delta R</math></b>		<b>Dep. var.: <math>\Delta M</math></b>		<b>Dep. var.: <math>\Delta P</math></b>		<b>Dep. var.: <math>\Delta Y</math></b>	
	<b>Coefficient</b>	<b>SE</b>	<b>Coefficient</b>	<b>SE</b>	<b>Coefficient</b>	<b>SE</b>	<b>Coefficient</b>	<b>SE</b>
<b>Constant</b>	-0.0003	0.0899	0.0029	0.0048	0.0030*	0.0018	0.0119**	0.0050
<b>ECT1</b>	-0.1790	0.4031	-0.0670***	0.0216	0.0131	0.0080	0.0076	0.0224
<b>ECT2</b>	-0.4921	2.8855	-0.5595***	0.1544	-0.0037	0.0571	0.1218	0.1602
<b><math>\Delta R_{t-1}</math></b>	0.4174	0.3826	0.0079	0.0205	-0.0041	0.0076	0.0282	0.0212
<b><math>\Delta M_{t-1}</math></b>	0.3830	2.5598	0.3821***	0.1370	0.0666	0.0507	0.3472**	0.1421
<b><math>\Delta P_{t-1}</math></b>	2.3731	8.0601	-0.9773**	0.4313	-0.1299	0.1596	-0.4357	0.4475
<b><math>\Delta Y_{t-1}</math></b>	-0.3608	2.9645	0.0820	0.1586	0.1125*	0.0587	0.1200	0.1646
<b>RMSE</b>	0.1043		0.0056		0.0021		0.0058	
<b>R<sup>2</sup></b>	0.1736		0.9455		0.9726		0.7839	
<b>AIC</b>					-25.7842			
<b>HQIC</b>					-25.2715			
<b>SBIC</b>					-24.2114			
<b>Log-Lik.</b>					433.655			
<b>FPE</b>					0.0000			

Source: our calculations.

With regard to residuals' autocorrelation, since we cannot reject the null hypothesis that there is no autocorrelation in the residuals for any of the twelve orders tested, the LM test gives no hint of model mis-specification. Moreover, in test for normally distributed disturbances, neither the single-equation Jarque and Bera statistic nor the joint one come close to rejecting the null hypothesis of normality. Checking the stability condition, since the modulus of each eigenvalue is strictly less than 1, the estimates satisfy the required condition. Indeed, obtaining Wald lag-exclusion statistics, the equations of money supply and price deflator appear to have a different lag structure from that of interest rate and real GDP. In fact, in

the first two equations, we cannot reject the null that these two endogenous variables have zero coefficients at the second lag. In contrast, in the others two equations, the coefficients on the second lag of the endogenous variables are jointly significant. However, we strongly reject the hypothesis that the coefficients on the first lag of the endogenous variables are zero in all four equations. Similarly, we can also strongly reject the hypothesis that the coefficients on the first and on the second lag of the four endogenous variables are zero in all equations jointly. Finally, the ARCH-LM test reveals the absence of volatility cluster in VECM residuals, while the CUSUM test show the model parameters stability.

Table 7 shows that growth rate is influenced by its second lag, but also by first lag of interest rate, money supply, and price deflator. These results are in line with Keynesian view, since money can influence real aggregates, so that non-neutrality principle would be disavowed. Granger-causality tests confirm these findings: money supply, price deflator, and output Granger-cause interest rate; interest rate Granger-causes money supply; while interest rate and price deflator Granger-cause real GDP. Moreover, all endogenous variables jointly Granger-cause the interest rate. Likewise, money supply and real output are Granger-caused by the others three endogenous variables. So, we have another reassurance in favour of money' non-neutrality hypothesis. Our results agree with that of in Koop (2004), in spite of this study concerns a wider period (1947q1-1992q4).

Finally, Impulse-Response Functions (IRF) and Forecast Error Variance Decomposition (FEVD) suggest analogous conclusions, since the variance of interest rate is above all due to shocks on interest rate itself, and in minor part to output shocks (in the medium-long run).

Tab. 8 – Results for Forecast Error Variance Decomposition of output (USA).

<i>Step</i>	<i>impulse = R response = Y</i>	<i>impulse = M response = Y</i>	<i>impulse = P response = Y</i>	<i>impulse = Y response = Y</i>
<i>0</i>	0	0	0	0
<i>1</i>	0.134592	0.039305	0.003309	0.822794
<i>2</i>	0.272912	0.127876	0.013553	0.585659
<i>3</i>	0.24441	0.164596	0.012125	0.578868
<i>4</i>	0.181729	0.179679	0.009262	0.629329
<i>5</i>	0.151171	0.18165	0.007161	0.660017
<i>6</i>	0.145148	0.179487	0.005772	0.669593
<i>7</i>	0.148436	0.176544	0.004843	0.670177
<i>8</i>	0.154492	0.173627	0.004178	0.667703
<i>9</i>	0.160766	0.171102	0.003684	0.664448
<i>10</i>	0.166334	0.169073	0.003308	0.661285
<i>11</i>	0.171041	0.167465	0.003013	0.658481
<i>12</i>	0.175001	0.166168	0.002776	0.656055

Source: our calculations.

Indeed, money supply' variance is due to its own shocks, either in the short-

run or in the medium-long one, besides for price deflator. For output (Table 8), we can conclude that its variability is determined, in the medium-long run, by shocks to output itself, but also – although in a residual and increasing way – by shocks to interest rate, money supply, and price deflator.

#### **4. – Concluding remarks**

The Reagan Administration was characterized, in the first place, by an important recession (the GNP, in 1982, dropped by 2.5%), followed later by an economic expansion that still lasted into the '90s.

In the period from 1973 to 1986, employment grew in the US to the order of 28%, compared with 11% growth in Japan and null growth in the EEC. Since 1970 more than 30 million jobs had been created in the United States, while in Europe the employment figure came to a standstill during the same period.

The balance of payments on current account in the United States turned out to be, on average during the Fifties, positive, and of the order of 0.1% in relation to the GNP. During the Sixties, the average annual balance was still positive and of the order of 0.5% of the GNP. During the Seventies the average was 0.0%, what meant that, on average, the balance on current account was balanced in that difficult decade. Since 1981, however, there has been a drastic change in tendency by which the annual average of the balance on current account had been, as a percentage of the GNP, -2.1%.

The consequence of the continuous deficits of the balance of payments during the Reagan Administration was that the United States passed, in a very few years, from being a creditor country in the international markets, to being the country with the largest net external debt. This had also negative effects on public expenditure, because the “twin deficits” phenomenon and the higher interest rates led to an interest payments increase.

The most important imbalances and costs that the Reagan economic policies generated were two: the tremendous fiscal deficits, which increased the internal debt to levels never reached, and the not less important deficits in the balance of payment which have catapulted the U.S. to the first place in the ranking of countries with foreign debt.

As regard to econometric results, our IS-LM model augmented for inflation shows how, using Federal Reserve Bank of St. Louis quarterly data, between 1981 and 1989 we might reject hypothesis of non-neutrality of money, so that money seems to have real effects.

We may, finally, synthesize the Reagan economic legacy in the following way,

according to its positive and negative outcomes: in the negative aspect, the legacy of fiscal deficit; the persistence of very high real interest rates, with their negative impact on the cost of capital in the country itself and with their negative consequences on the economies of other countries; the legacy of a huge balance of payment deficits which, in a very short period of time, converted the United States into the world's largest debtor, once having been the largest creditor; and finally, the inability to stop and reverse the secular deterioration of two relevant variables of the American economy, such as the drop in personal savings, and the worsening of the income distribution.

On the positive side, there are four things that must be pointed out: first, the control of inflation, from the two-digit figures of the beginning of the Eighties to figures that averaged 4%; in the second place, the creation of employment, even if a major part of it was created in the services sector and with very low remuneration; third, the strong reduction of Misery Index, from 17.9% to 9.5%; and last, but probably the most important point, the new vision that Ronald Reagan suggested about government size and free market possibilities.

Our results show how, beside to a Keynesian fiscal policy – with tax cuts and public expenditure increases, which provoked a public budget deficit – Reagan's measures had a Keynesian aspect in monetary policy, too. GDP variability is determined, in the medium-long run, by shocks to output itself prevalently; but also by shocks to interest rate, money supply, and price deflator.

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