

MACRO-FINANCE: APPLICATION OF FINANCIAL ECONOMIC THEORY FOR IMPLEMENTING MACRO-ECONOMIC POLICY

Ronald W. Spahr

*National City Bank Distinguished Professor of Banking and Finance
College of Business and Management
University of Illinois at Springfield
Springfield, IL 62794-9243
Tel: (217) 206-6858
Fax: (217) 206-7543
e-mail: spahr.ronald@uis.edu*

Mohammad Ashraf

*Assistant Professor of Economics
School of Business
The University of North Carolina at Pembroke
Pembroke, NC 28372
Tel: (910) 521-6464
Fax: (910) 521-6165
e-mail: mohammad.ashraf@uncp.edu*

Nancy Scannell

*Associate Professor of Finance
College of Business and Management
University of Illinois at Springfield
Springfield, IL 62794-9243
Tel: (217) 206-7915
Fax: (217) 206-7543
e-mail: scannell.nancy@uis.edu*

Yuri I. Korobov

*Professor of Economics and Banking
Saratov State Socio-Economics University
Saratov, Russia
Tel: 011-784-5225-4741
E-mail: korobov@renet.ru
Web: <http://zmv.renet.ru>*

September 24, 2002

For presentation at the Economics and International Business Research Conference,
Miami, Florida, December 17 - 21, 2002, Miami Beach Hotel, South Beach, FL, U.S.A.

Preliminary draft. Please do not quote without permission
from the authors. Comments are welcome.

MACRO-FINANCE: APPLICATION OF FINANCIAL ECONOMIC THEORY FOR IMPLEMENTING MACROECONOMIC POLICY

This article was published in *The Journal of American Academy of Business*, vol. 2, no. 2
(March 2003)

Abstract

We define macrofinance as the application of traditional financial economic theory to the macro-economy postulating that macroeconomic activity results from aggregate effects of all domestic private and public saving, investment, net international trade and consumption decisions. We suggest that a single economic policy objective should be the maximization of the composite wealth of the country's stakeholders, the country's total population. This national welfare objective is analogous to the financial economic objective of maximizing shareholders' wealth in the case for a single firm. Maximizing owners' wealth for a single firm involves the discounting of future cash flows (usually dividends) accruing to the firm's shareholders. For a nation's economic welfare, a parallel concept may be operationalized by maximizing the present value of a country's long-run, sustainable, real standard of living, i.e., maximizing discounted future cash flows associated with the consumption component of GDP. We apply the macrofinance methodology to identify characteristics of macroeconomic policy, which may be less transparent given current objectives of economic policy.

MACRO-FINANCE: APPLICATION OF FINANCIAL ECONOMIC THEORY FOR IMPLEMENTING MACROECONOMIC POLICY

The multiple objectives of traditional monetary policy was articulated in the United States of America Employment Act of 1946, but since has become the cornerstone of macroeconomic policy for many countries. The objectives of traditional monetary policy have been interpreted to include shorter-term stabilization of price levels, control of employment and growth levels, stabilization of money and capital markets, and balancing of trade. These objectives and their resulting implementation by controlling money supplies are adopted almost universally by most central banks. However, because of multiple and sometimes conflicting objectives and short-term emphasis, monetary policy is difficult to delineate for various economic conditions.

The thesis of this paper is that the traditional financial economic paradigm for valuation and financial decision-making within the individual firm (corporate finance theory) may, with modifications, be applied to determine policy objectives for a nation's macro-economy. "Macrofinance" is defined as the application of financial economic theory and practice to the macro-economy, assuming that economic activity results from aggregated effects of private and public decisions regarding all domestic economic savings, investment, net international trade and consumption. Analogous to the single firm objective of maximizing stock prices, macrofinance proposes that the primary national economic policy objective should be maximizing the composite wealth of a country's stakeholders. We further interpret maximizing the composite wealth of a country's stakeholders as the maximization of a population's long-run sustainable standard of living.

Differences between standards of living resulting from differences in economic systems and level of capital formation may be illustrated by comparing the standards of living in Russian and the United States. It is apparent from general observations and from economic statistics such as the Gross Domestic Product (GDP) per capita that the standard of living in the Russian Federation is lower than in the United States (U.S.) and other developed economies. cursory explanations for living standard discrepancies between emerging versus more developed economies often rely on relative development stages of their banking, capital market system and legal and social infrastructures. Developed economies are characterized by developed banking systems, efficient capital and financial markets, and a rule of law with strong individual property rights. The legal system must be reliable and consistent, always enforcing legitimate contracts. The legal system must also enforce due diligence and provide oversight for regulations prohibiting fraud and manipulation of capital and financial markets. However, the mere existence of efficient capital markets, a healthy banking system and a stable political and legal system does not necessarily result in the highest possible standard of living. Other more basic economic concepts and the formulation of an efficient national economic policy may improve both the standard of living level and the speed at which underdeveloped economies can approach living standards of developed economies. As an example, a basic economic construct facilitating higher standards of living is that developed economies possess higher degrees of cumulative capital investment. Capital investment allowing for the application of modern technology, which facilitates higher labor productivity reasonably explains higher standards of living in developed countries. Thus,

the promotion of capital investment as well as other factors, usually associated with traditional financial economic theory may be incorporated into national economic policy.

Possible constraints

It is understood that the maximization of the average citizen's standard of living is not the only societal goal, where social responsibility would dictate that transfer payments and public programs be made available to members of society with below average standards of living and who are unable to adequately provide for themselves. An example of excess transfer payments and public programs occurred during the 1980s in Russia prior to its reforms. The Russian economy was characterized by the weight of social transfers, including retirement pensions, family allowances, and agricultural resources in kind (Prokofieva and Terskikh, 1998).

In addition, there are functions in society that may be more efficiently provided by the public sector rather than the private sector. We recognize that these societal goals exist and should be considered in a macrofinancial model. These societal goals, however, do not substitute for or replace the main goal for the country's stakeholders of living standard maximization, but may be included in the model as constraints. For example, a constraint may be added to the model that restricts the level of income for any person in the country from falling below some predetermined level. Likewise additional constraints may be added to the model that require certain services to be provided by the public sector rather than the private sector. However, as with any maximization model, it should be recognized that any constraint on the objective of maximizing average standard of living would reduce the optimal potential standard of living. Thus, in this paper, we will generally ignore (or treat as given) most of these other societal goals, and

concentrate on the model formulation and the impact of economic variables on the long-run objective of maximizing standard of living.

The Proposed Objective of Macrofinance Policy

The application of conventional monetary theory for implementing economic policy differs significantly from the macrofinance approach suggested in this paper. The macrofinance approach suggests the consideration of other economic factors in addition to monetary and interest rate controls in implementing economic policy. The U.S. Federal Reserve System, the Russian Federation Central Bank and many of the world's central banks are constitutionally independent for implementing economic policy, but the tools by which they are expected to implement economic policy are limited to control of the money supply and interest rates. They affect essentially no long-term consumption-investment decisions and have little control over longer-term economic stimulus variables. These are reserved for fiscal policy as implemented by federal governments. However, because fiscal policy can only be affected through legislation, there may be little congruence in direction and timing between monetary policy implemented by the central bank and fiscal policy legislated by the federal government.

The effectiveness of conventional macroeconomic theory and policy, as implemented by most of the world's central banks is limited because of its inability to simultaneously satisfy its multiple and often conflicting objectives. In autumn 1993, for example, the Russian government took measures including cutting money growth rates to establish a basis for its 1994 stabilization program. At that time, Russian authorities actively debated a choice of course: whether to sharply cut inflation rates or to pursue a slower, more cautious path, thereby avoiding conflicting economic objectives and

political decisions necessary for the success of stabilization. By their own experience, they realized that one has to pay a high price for a soft monetary policy (Gaidar, 1997).

However, we do not necessarily agree with Gaidar as we believe that much of the inflation experienced in the Russian economy has resulted from a lack of productivity and a lack of expected increases in productivity and not from excess demand. A macrofinance policy suggests that a longer-term time horizon be considered. Given an extended time horizon and an objective of maximizing the long-run living standard in an emerging economy, a more expansionary monetary policy coupled with capital investment incentives would be warranted. We believe that this longer-term approach to economic policy would better serve to reduce inflation over a longer time horizon than a restrictive monetary policy as traditional theory posits.

Given that current monetary policy tools are lacking in their ability to implement and control macroeconomic activity, we suggest that central bank policies should consider not only monetary/interest rate policy, but also policies that more explicitly include long-term aggregate effects on public and private GDP components. We suggest that central banks adopt the macrofinance objective, to maximize the present value of the consumption component of discounted future per capita GDP flows. In line with historic levels, current consumption in the U.S. accounts for approximately two-thirds of GDP. The same scenario generally holds true for Russia, where the consumption component has averaged slightly higher.¹

¹For Russia, aggregate GDP growth in 2001 was driven increasingly by private consumption demand. The contribution of private consumption to the aggregate growth rate was approximately twice as high as that of investment (World Bank, 2002).

The macrofinance model is operationalized by affecting decision variables similar to those used in individual firm financial management. For example, the dividend payout/earnings retention decision for a single firm corresponds to consumption versus investment in macro-economies. Higher current consumption may increase the current standard of living, but to the detriment of future economic growth and the future standard of living. Just as for a single firm, many factors influence the level of current and future real net investment. Expected economic growth, current and expected future levels of interest rates, the availability of viable real investment opportunities, as well as the availability of capital (savings and capital market efficiency), must be included in this dynamic decision model. For example, higher current and expected economic growth (which can be affected by traditional monetary and fiscal policies), lower current and expected future interest rates and the availability of lucrative real investment opportunities, (which may be more of a product of fiscal policy than monetary policy) may result in higher current capital formation with potentially higher future living standards.

Monetary policy, through open market activities, control of certain short-term interest rates and control of the bank reserve system, affects the money supply and the supply of loanable funds-availability of capital. However, for a single country in isolation, the effectiveness of uncoordinated monetary policy may result more from fiat than fact in today's global economies.² Central bank effectiveness in controlling the consumption of goods and services and the supply of loanable funds is severely diminished by the availability of both short-term and long-term funds in foreign capital markets

and the proliferation of additional money or near-money instruments. Control of the domestic money supply, which is attributed with impacting the supply of loanable funds and consumption spending, is assigned inordinate credit under the regime of conventional monetary policy. This is equivalent to the misguided reliance on the control of only the supply of capital to manage a single firm.

In developed economies, consumption spending is limited more by aggregate effects of banks' control of lending underwriting standards than the central bank's control of the money supply. The ability of individuals to consume depends more on their current wealth and their debt service capacity rather than the availability of credit. Banks depending on the five C's of credit (Character, Capacity, Collateral, Capital and Conditions) control the availability of credit where Capacity is perhaps the major controlling variable. Rather than the availability of credit, aggregate effects of individual consumer capacity to service loans as well as consumer and lender confidence in the economy are what influence total domestic consumption. Thus, we posit that consumer current wealth and borrowing capacity, where lending is effectively controlled by the banking system, potentially affects consumer spending to a greater extent than the central bank's control of the domestic money supply.

For example, Kharas, et.al. (2001) notes with respect to Russia that in the real world fundamentals and confidence are intertwined, and second-generation crisis models help to emphasize the presence of multiple equilibria, where changes in market sentiment or confidence can trigger a sudden capital outflow and precipitate a crisis even when the fundamentals are sound. The second-generation crisis possibility results from the

² We posit that much of the United States Federal Reserve's affect on the economy is due to psychological impact on the market place and potential consumers rather than their control of the money supply and credit

primary crisis of 1998. The primary crisis can be explained by unsound market fundamentals; however, a second-generation crisis could result from changes in market sentiment or confidence even with sound market fundamentals. Thus, in an emerging market that has experienced a recent crisis as in the Russian Federation, public confidence is more sensitive to political and media announcements, and consumer and investor confidence again may result more from fiat than fact.

Even after ten years of transition, banking systems in a number of newly independent countries including the Russian Federation have difficulty finding productive loans and borrowers who meet minimal underwriting standards. Given loan demand, banks have sufficient deposits and supplies of loanable funds, but demand for loanable funds is lacking. Thus, economic policy must concentrate on creating a demand for loans and the social infrastructure necessary for developing an economy and society that is credit sophisticated.

Banks that dare to make loans, given the country's weak infrastructure, can expect large default rates. Even when banks win default judgments, collateral can prove impossible to sell. Deposits are more likely relegated to the safe haven of 2-percent-yielding Treasury Bills (The Economist, April-May 2001).

The lack of credit demand and lack of a credit infrastructure is referred to by Tigran Sarkissyan, Chairman of the Central Bank of Armenia. He announced a more expansive monetary-credit policy for 2001, but was skeptical of increasing the supply of loanable funds when the most negative factor detrimental to Armenian banks' is the low quality of their credit portfolios (Arka 2000). Very often, Armenian banks suffer losses due to poor economic conditions. The trend of declining growth rates for bank lending is

availability.

likely to continue in 2002 due to certain risk exposures in lending to the real sector and a loosened link between banks and the economy (CBA 2002).

In Russia, despite an overall increase in assets in its banking system and in the ratio of M2 to GDP and a decline in lending rates, the share of long and medium-term credits decreased in 2001, and accounted for only 15.4 percent of all credits to the private sector. Russia's commercial banks continue to refrain from long-term lending to the private sector because of difficulties in dealing with collateral and with recovering loans that have gone bad (World Bank, 2002). Sberbank, Russia's savings bank and the nation's largest, is 61 percent owned by its regulator, the Russian Central Bank. Many Russians refuse to trust any bank. Case in point, Sberbank lends to industrial companies that the government wants to support (The Economist, March 2001). That Sberbank deposits have increased does not reflect increased confidence in the state bank. It simply reflects the post-devaluation rise in consumer prices, which increases the quantity of money required for transactions. Other Russian commercial banks have been unable to gain the confidence of depositors (RECEP 1999).

Monetary policy effectiveness in emerging markets such as the Russian Federation and other newly independent states is also reduced because of chronic shortages of long-term investment capital (common stock and long-term debt). For example, much of the Russian population has little history or infrastructure facilitating access to long-term credit systems. This limits the effectiveness of commercial and investment credit functions. Fundamentally, this problem results from a lack of long-term investment capital in the economy and a lack of personal wealth, which in turn, results from low productivity and a low standard of living. Thus, the role of monetary policy in the

Russian Federation should be to stimulate the availability of long-term credit (stocks and bonds), facilitate capital formation by increasing the efficiency of capital markets and increase the standard of living. It is doubtful that inflation in Russia is a consequence of excesses in personal consumption or credit availability.

Financial economic theory establishes the maximization of stockholders' wealth, i.e., maximizing stock prices, as its global objective, in the governance of its corporate decisions. Achieving this single objective is paramount in capital investment decisions, financing decisions, dividend decisions, working capital decisions and all other decisions facing corporate management.

Review of the Literature

A body of macroeconomic literature, including Keynesian and Monetarist theories, explores relationships of monetary policy and monetary changes with domestic economic output, growth in labor productivity and standard of living. However, little work exists that challenges the efficacy of existing macroeconomic theory. In a seminal paper that hints of the need for supplementary economic concepts and additional control mechanisms, Muth (1961) argues that much of modeling in macroeconomic literature does not attribute economic agents with adequate levels of rational behavior and confers limited credit to their understanding of the functioning of the economic system and agents' economic decisions within that system.

The Natural Rate Hypothesis espoused by Friedman (1968) and Phelps (1972) posits that a permanent inflation-output trade-off is conceivably an "illusion." They argue that proactive government policies payoff only in the short run due to workers'

sluggish comprehension of and adjustment to increases in inflation rates and declining currency values. In effect, workers misinterpret the effects of inflation on real wages. However, this simplistic conclusion fails to consider the dynamics of longer-term effects of capital formation and technology advances on productivity. From a macrofinance view, the role of inflation is viewed most critically in terms of its volatility and its effect on nominal interest rates, the cost of loanable funds, and the cost of investment capital. In turn, nominal capital costs and the uncertainty of real interest rates affect the capital investment decision, capital formation, and job creation. Macrofinance challenges the validity of the impact of inflation increases on natural rate inflation-output tradeoffs. Higher employment levels result from increasing the demand for labor through job creation and the potential for a higher standard of living (increased consumption) through increased productivity, and not by workers' misinterpretation of inflation effects. Job creation results from incremental capital investment in labor, a more highly trained workforce, and the enticement of a higher standard of living resulting from increased real productivity. These are major determinants in achieving the longer-term objectives of low unemployment and stable price levels.

In consideration of Muth and the natural rate hypothesis, rational expectations economists Lucas (1972, 1973), Sargent and Wallace (1975), Barro (1976, 1977, 1978, 1981), Barro and Rush (1980), Fischer (1980), Alberro (1981), Mishkin (1983), Kormendi and Meguire (1984), Kretzmer (1989), Mohabbat and Al-Saji (1990), and others, afford credence to the notion that workers and investors (see the literature on efficient capital markets) cannot be systematically fooled. Economic agents who attempt to maximize their own welfare incorporate all available information, including actions of

the Federal Reserve (See Sargent and Wallace, 1975), into their expectations for inflation. Thus, the predictable, systematic component (anticipated changes) of monetary policy is rendered ineffective given varying economic conditions. Because people sometimes are fooled and do make mistakes, the unemployment rate may fluctuate, moving away from the "natural rate," but this movement will follow a short-term random process. However, if the objective of economic policy is long-term maximization of the standard of living, more stable or consistent monetary and fiscal policies would be in order.

Fischer (1980) accepts the rationality of expectations and that only unanticipated monetary changes affect real variables. He argues that the role of proactive monetary policy is based on the need for stable prices and the private sector's desire for insulation against aggregate economic shocks. Insulation against output variations can be realized by short-term, private contingent contracts (futures and options), albeit at considerable expense. Fisher contends that the Federal Reserve can provide the requisite insulation by employing relatively fewer resources, leaving room for activist policies. However, if the cost of insulation against economic shocks resulting from Federal Reserve initiatives detracts from the longer-term objective of maximizing the standard of living, economic risk management may feasibly be accomplished more efficiently in private markets. Fischer also suggests that the time horizon may be the relevant factor in determining whether only unanticipated changes in monetary policy affect real economic variables. Fischer argues that one-year forecasts employed by Barro (1977 and 1978) and Lucas (1973) are too short to explain output performance data.

Mishkin (1983) tests the hypothesis that only unanticipated monetary shocks

affect real variables and suggests modifications to prior works by Barro (1977, 1978) and Barro & Rush (1980). In addition to past money growth, Mishkin specifies Treasury Bill rates and high employment budget surpluses as explanatory variables to money growth. Mishkin uses both a shorter lag length (usually two-years or less) and a longer lag length in his maximum likelihood ratio test of joint effects of money, output, and unemployment. His results indicate that for shorter lag length, only unanticipated monetary shocks affect real variables but, for longer lags, unanticipated as well as anticipated monetary shocks have significant impact on real output and unemployment rates. Contrary to earlier studies, these results suggest that with increased lag length, anticipated monetary shocks produce increasingly stronger impacts on real economic variables.

Summing up, the impact of monetary shocks on real economic variables and employment, whether anticipated or unanticipated, is at best, ambiguous. With escalation in globalization, financial innovation and the ability of banks as well as non-banks to extend credit and effectively create money, confidence in the relevance and utility of central banks' traditional monetary tools, policies and structure is challenged. Notwithstanding, Sellon and Weiner (1996), Friedman (1999), and others acknowledge that the U.S. Federal Reserve might retain some capacity to exert influence on the economy through monetary policy.

The foregoing prompts inquiry into why the existing literature, in spite of its detail-rich mathematical elegance and finesse, is theoretically naïve with respect to the basic question: are activist practices of central banks effective, and do these practices produce long-run positive or negative effects on capital formation, labor productivity and

the standard of living? Indeed, much of the previous literature has dealt with micro aspects of macroeconomics, thereby escaping contemplation of policy implications for long-run economic stability and viability. We posit a more appropriate approach to addressing these questions, which calls for the application of financial economic theories and observance of practices executed by individuals and corporate America. Given that the macro-economy is largely dependent on aggregate consumption and public and private investment decisions, corporate economic units play a very important role in the macro-economy basing their investment decisions on their expectations for real interest rates versus real returns on assets.

The Macrofinance Model

As referenced earlier, preoccupation with contemporary monetary policy is analogous to a single firm's reliance on controlling only the supply and availability of capital to manage its operations. However, to afford adequate control of the private firm and to realize the objective of maximizing owner's wealth, many other contemporaneous and lagged factors must be considered that bear upon a firm's present as well as future state of affairs. Included among these are lagged effects of past net investment (cumulative net investment), financing (capital structure) and reinvestment decisions.

When applying traditional macroeconomic theory, central bank implementation of economic policies may assign inadequate weights to important components of economic vitality and standard of living. These include contemporaneous and lagged effects of public, individual and industrial capital investment (cumulative stock of real capital), a financing decision (whether capital comes from the private or public sector) and the

market value added (the excess of market value to book value of invested capital) created by liquid, efficient and creditable capital markets.

Given that the maximization of the present value of the consumption component of future GDP per capita involves the reinvestment of wealth, capital investment, the private and public discount rate and the return on private and public investment, we formulate a model that implicitly incorporates these factors.

The discounted cash flow perpetuity model (DCF Model) commonly used to estimate the value of an individual firm's shares results from the present value of a geometric series for dividends as:

$$P_0 = D_0 [(1+g)/(1+k) + (1+g)^2/(1+k)^2 + (1+g)^3/(1+k)^3 + \dots + (1+g)^N/(1+k)^N] \quad (1)$$

If, N is assumed to approach ∞ , this geometric series may be reduced to:

$$P_0 = D_0 (1+g)/(k-g) \quad (2)$$

This is the commonly applied Discounted Cash Flow Model (DCF), where P_0 is the current share price, D_0 is the current annual dividend per share, g is the estimated future constant growth rate for dividends per share, earnings per share or book value of equity per share, and k is the appropriate risk-adjusted discount rate. The DCF model assumes that the growth rate, g , is estimated as $(1-p) \cdot \text{ROE}$, the product of the firm's retention ratio, where p is the payout ratio, and Return on Equity or the average return on invested equity capital, ROE (composite rate of return on existing and new capital investments). Obviously, firms that retain most of their earnings or have low dividend payout ratios (low values of p) and those firms that have high rates of return on existing and future capital investments (high reinvestment rates) will usually generate higher firm growth rates and share prices. It is evident that the geometric series for stock price

estimation is anything but linear and is a function of current and future factors and firm specific decisions.

Similar to the pricing function for an individual firm, macro-economies are also dynamic, nonlinear functions involving more factors than for a single firm. Exogenous factors such as a country's quantity and quality of exploitable natural and energy resources, the quantity and quality of its farmland and its climate are major factors in determining an attainable standard of living for a country's population and the speed, by which economies can develop. Analogous to the single firm, these exogenously determined resources and natural advantages, if present, are major factors in a country's potential return on invested capital. The store of resources available to a country for economic development is analogous to the capital available for business investment opportunities by an individual firm. However, endogenously determined variables or variables that can be manipulated by economic policy also may significantly affect the return on a country's invested capital, return on real assets and the population's standard of living. Some of these policy-driven, long-run, endogenously determined variables are the population's literacy rate, education level and quality of its school system, the degree of development and efficiency of the country's banking and capital market systems, the degree of development and sanctity of its court and legal system, and the degree of development of its private relative to its public business sector. Thus, as the return on invested capital and the proportion of GDP reinvested (including external investment) in the economy increase, a country's GDP growth rate and growth rate in per capita consumption may increase at a faster rate resulting in a higher growth rate for future consumption and the future standard of living.

A model that estimates the average value of each stakeholder's (citizen's) share of future consumption may be written as the sum of two geometric series (one for the private sector and one for the public sector of the economy):

$$V_0 = C_P * PGDP_0 / POP_0 [(1+h)/(1+r_P) + (1+h)^2/(1+r_P)^2 + (1+h)^3/(1+r_P)^3 + \dots + (1+h)^N/(1+r_P)^N] + C_G * GGDP_0 / POP_0 [(1+j)/(1+r_G) + (1+j)^2/(1+r_G)^2 + (1+j)^3/(1+r_G)^3 + \dots + (1+j)^N/(1+r_G)^N] \quad (3)$$

Assuming N approaches ∞ , this geometric series, in (3) reduces to:

$$V_0 = C_P * PGDP_0 / POP_0 [(1+h)/(r_P-h)] + C_G * GGDP_0 / POP_0 [(1+j)/(r_G-j)] \quad (4)$$

where V_0 is the per capita discounted present value of total current and future consumption resulting from both private and public per capita GDP, POP_0 is the current population, C_P (assumed to be constant in the future) is the current proportion of annual per capita real private consumption relative to per capita current private sector real $PGDP_0/POP_0$, C_G (also assumed to be constant in the future)³ is the current proportion of annual per capita real public consumption relative to per capita current public sector real $GGDP_0/POP_0$, h is the future growth rate for per capita real private sector consumption, j is the future growth rate for per capita real public sector consumption, r_P is the private sector cost of capital (rate of return required on privately invested real capital) and r_G is the government or public sector cost of capital (public discount rate or return required on public real investments). Similar to the DCF model for a single firm, growth rates for consumption are functions of both the amount of and return on past and future annual investment in both the private and public sectors. The annual proportion of private sector GDP, including external investment in private sector capital projects (private investment) and the real rate of return on real private sector capital investments, r_P , is a determining

³ Both C_P and C_G could be subscripted for time and would not necessarily be considered constant across time.

factor for the growth rate for future private sector consumption. Likewise, the annual proportion of public sector GDP invested in public sector capital projects (public investment) and the rate of return on real public sector capital investments, r_G , determines the growth rate for future public consumption.

We assume the following relationships:

$$h = (1 - C_P - T - X + M + F) * r_P = P * r_P$$

$$j = (T - C_G) * r_G = (1 - C_G - C_P - P + F) * r_G = G * r_G \text{ and}$$

$$C_P + T + P + X - M = 1$$

$$G + C_G = T$$

where T is annual real tax revenues relative to total GDP ($GDP = PGDP + GGDP$), G is the proportion of annual real public investment relative to total GDP, P is the proportion of annual real private investment relative to total GDP, X is the proportion of annual real exports relative to total GDP, M is the proportion of annual real imports relative to total GDP and F is the proportion of annual real private external or foreign net investment relative to total GDP, where F is the net of real foreign investment inflows less foreign investment outflows. The first two of the above relationships are analogous to the formula $(1-p) \cdot ROE$ from the individual firm DCF model.

Equations (3) and (4) above represent the present value of all future real consumption per capita that will be available to the average citizen. This may be considered his or her endowment that will sustain current and future living standards. It is obvious that the geometric series and the resulting closed form solution carries with it significant implications. The economy, contrary to common political rhetoric, is not a linear stationery series, but rather a very dynamic, non-stationery series that is dependent

on many different factors and economic variables. Just as for reinvestment of retained earnings for private firms, reinvestment of GDP, both public and private, along with net foreign investment, especially in the private sector, will substantially increase annual growth rates for future real consumption and real GDP and cause an increase in the discounted present value of future public and private consumption. For public investment, which results from the investment of tax revenues, the investment effect on living standards may not be as great as compared to the private sector, because public investment projects are not required to meet capital markets tests. Since it is commonly assumed that $r_P > r_G$, it should be anticipated that public investment would result in lower growth rates for real GGDP and real public consumption relative to private investment's impact on growth rates in real PGDP and real private consumption. Thus, long-term policies that promote the growth of public investment by crowding out private investment may create in the longer run a lower living standard than would be possible with more private sector investment.

Unproductive Component of GDP (Social Waste)

It is widely accepted that labor productivity is a major factor in determining a country's standard of living. However, it is questionable whether GDP resulting from less productive or possibly unnecessary employment where, at the margin, these employees produce little or no "true" economic product, should be included as part of total GDP. Adam Smith (1776) called this "social waste." These jobs, particularly those jobs found in the public sector, by definition, supply a product that yields little benefit to society. They are dead weights on the economy and would tend to reduce the country's standard of living. It is advisable that salaries and compensation for this unnecessary

employment be excluded from total GDP, and that these employees be excluded from labor force statistics if we desire to measure “true” productivity and true potential for the standard of living. These employees are a drain on the standard of living for every person in the country. These positions could possibly be eliminated by changing laws, reducing unnecessary functions or by more efficiently providing given services.

An example of such waste in the U.S. is the utilization of substantial professional resources to administer and provide oversight with regard to income taxes collected by the U. S. Internal Revenue Service. The Cato Institute estimates that the annual cost to the economy of compliance with the current tax code is approximately \$400 billion.⁴ The extremely cumbersome U.S. tax system could be replaced by a simpler system, such as a flat tax as used in the Russian Federation or a value-added tax. Tax professionals, many of whom are accountants and attorneys, would be freed to pursue alternative careers that would instead promote genuine economic output. As countries, such as the U.S., continue to burden their economies by enabling otherwise productive labor to engage in less productive or unnecessary work, the standard of living for the country’s citizens will subsist below its potential level. The effect of this dead weight is difficult to measure, but its effect may be exemplified by the relatively lower contributions to standard of living associated with the public sector as compared to the private sector.

The Russian Federation recently adopted a tax code that levies a thirteen percent flat tax rate on all personal income. Consequently, oversight is more expeditious, taxpayer compliance has substantially improved and federal tax revenues have significantly increased. Given a poor historical record of compliance and collection of

⁴ Social waste created by the current U.S. income tax code is only slightly less costly than the Social Security System, which currently pays out approximately \$432 billion annually.

personal income taxes, the flat tax is evidenced to be the most feasible approach to personal income taxation policy in the Russian Federation.

Analysis

Figures 1 and 2 present a number of economic variables that may explain the standard of living for the U.S. This data, however, is unavailable for the Russian Federation. Observations from figures 1 and 2 are that the standard of living is strongly positively related to the stock of capital invested per laborer, and the proportion of the population employed in the labor force, and possibly negatively related to private sector taxes relative to private sector domestic income. The first two variables contribute positively to standard of living while, as expected, government size and higher private sector taxes detract from the standard of living.

Preliminary observations are consistent with the original position of this study that major factors in explaining the relative standards of living in the U.S. and the Russian Federation are the stock of invested capital and productivity of the labor force. Productivity is enhanced by cumulative capital investment, where the stock of capital accumulated over time is due to the efficiency, credibility, regulation and liquidity of U.S. capital markets and the prominent role played by U.S. and foreign commercial and investment banks. The banking system, including investment banks, also provides substantial debt capital. The accumulation of U.S. stock of capital has amassed from a history of technical innovation, creative ingenuity, the willingness of investors to take risk, the rule of law, the recognition of individual property rights, capital provided by foreign investors and the general availability of superior capital investment opportunities.

Figures 1 and 2 show that the standard of living over the 1970 through 1998 time period is positively related to the increase in the percentage of the U.S. population employed in the labor force. This increased living standard may also be attributed to the increased numbers of women and minorities, who have entered the labor force during this time period.

Figures 3 and 4, respectively, show the share of aggregate world nominal GDP and per capita nominal GDP, both based the Purchasing Power Parity (PPP) valuation method. The percent share of aggregate GDP for the U.S. relative to the world GDP remained rather constant at roughly 22 percent for the 1980-2000 time period; whereas, over the same period, the comparable share for the Russian Federation declined significantly.⁵

As previously hypothesize, the size of the economy's public sector relative to the size of the private sector has an inverse relationship with the standard of living. We posit that this relationship holds due to the preponderance of unproductive employment practices characteristic of the public sector. Thus, we conclude that the productivity of the private sector is perhaps the most critical factor in raising the standard of living.

The consequence of a steadily increasing tax burden on the U.S. economy is a significantly reduced potential standard of living. Aggregate, federal, state and local taxes collected from the private sector supplant capital otherwise available for more productive private sector ventures.

⁵ The PPP are used rather than official currency exchange rates. The PPP method involves the use of standardized international dollar price weights, which are applied to the quantities of final goods and services produced in a given economy. Data derived from the PPP method provide the best available starting point for comparisons of economic strength and well-being between countries.

In the case for balance of trade, recent history indicates that a negative balance (imports exceeding exports), has a tendency to depress a country's standard of living.

Economic Value Added (EVA) and Market Value Added (MVA)

In addition to previously discussed concepts, we further consider two distinctive concepts inherent and valued in efficient capital markets, Economic Value Added (EVA) and Market Value Added (MVA). The market valuation of EVA and MVA facilitate wealth generation and value creation in an economy. EVA is a firm's net operating profit minus appropriate charges for the opportunity costs of capital invested. Thus, EVA is an estimate of economic profit, or the amount by which earnings exceed or fall short of the required minimum rate of return that shareholders and lenders could earn by investing in other securities of comparable risk. MVA capitalizes not only expected EVA of assets in place, but it also capitalizes expected EVA from potential future projects. To the extent that actual economic value added is larger (smaller) than expected EVA, the market value may increase (decrease) for realized levels of EVA. For entire economies, the macrofinance equivalent of annual MVA is annual net capital invested plus the excess of total stock market valuation above the book value of equity invested. Since debt financing is contractual, excess MVA (representing the cumulative value of project net present values) is represented by increases in total stock market valuation.

Conclusions

It is apparent from Figures 3 and 4 that the standard of living in the United States is considerably higher than in the Russian Federation as measured by the GDP per capita for the population of each country. We investigate the reasons for this relative difference in living standards and pursuant to this relative difference, we make recommendations

regarding the implementation of economic policy in both countries. We propose a more focused, more inclusive approach to the implementation of economic policy by proposing a macrofinance model. We observe that economic monetary policies and practices employed by the U.S. Federal Reserve System, in attempting to control the U. S. economy and implement economic policy, differ significantly from the theory and practice that is implied in our macrofinance model. The macrofinance model applies more general financial economic theory originally developed for managing an individual firm. However, we propose that similar theory as applied in corporate finance (maximizing stockholder wealth) should be extended to general stakeholder theory for a county's economy. The objective should be to maximize the standard of living as defined above. We also observe that controlling the money supply, affecting the quantity of loanable funds and affecting the level of interest rates have little or potentially negative long-term effect on the stock of invested capital in the U.S. It is observed that the cumulative stock of capital per worker, the addition of women and minorities to the labor force, and the adoption of technological improvements are important factors in explaining differences in the standards of living between the U.S. and the Russian Federation. Arguably, the most important factor, the cumulative stock of capital, in any country is influenced by the efficiency, credibility, regulation and liquidity of capital and financial markets and the effectiveness of domestic and foreign commercial and investment banks in providing capital to domestic companies. An atmosphere of innovation and creativity that fosters the development of new capital investment opportunities and a value-maximizing market system are more compelling arguments in explaining the relative

standards of living between developed and less-developed countries than the application of short-duration monetary policy.

Monetary policies implemented in today's international economies are relatively ineffective, where any effectiveness results more from fiat than substance. The ability of the money supply to control consumption and the availability of loanable funds are severely diminished due to the availability of these funds in other capital markets and the proliferation of additional money or near-money instruments. The U.S. Federal Reserve's control of the money supply that, in turn, is assumed to control consumption spending and demand-pull inflation, is over crediting monetary policy. Consumption spending is limited more by the banking system's control of underwriting standards than Federal Reserve policy. The ability of individuals to consume depends on their current wealth and the availability of credit. Current individual consumption is limited to each individual's capacity to service his or her loans. Thus, current wealth and borrowing capacity, controlled by the banking system, controls consumption spending to a much greater extent than the money supply.

In developing economies such as in the Russian Federation, a macrofinance policy suggests that a longer term time horizon be considered. Given an extended time horizon and an objective of maximizing the long-run living standard in an emerging economy, a more expansionary monetary policy coupled with capital investment incentives would be warranted. We believe that this longer-term approach to economic policy would better serve to reduce inflation over a longer time horizon than a restrictive monetary policy as traditional theory posits.

With regard to corporate and business investment, loanable funds may be available for capital investment projects even during periods of tight money because of the availability of capital from foreign markets. The level of interest rates as affected by monetary policy may have marginal effects on capital investments. However, continued capital formation is more a function of the efficiency of capital markets and the availability of lucrative capital investment opportunities than the level of interest rates. In less developed economies such as the Russian Federation, the lower level of capital formation is more a function of the infancy of the capital market system than either the availability of loanable funds or the level of interest rates.

As interest rates will rise and fall, corporations, by using utilizing the call provision on debt, have the flexibility (option) of reducing their cost of capital in response to declines in interest rates by refunding debt. Thus, in economies with developed capital markets, decisions whether to go forward or not with capital projects are only slightly affected by levels and variations in interest rates. The exclusive scenario inhibiting capital formation is where interest rates are high and very little interest rate volatility exists, where low volatility reduces the value of the refunding option.

We conclude that the U.S. Federal Reserve has lost much of its ability to control the economy and especially its ability to promote long-term growth, capital formation and increases in real standard of living. Thus, we suggest changes to central bank policies and objectives. These changes are to possibly eliminate current commercial bank reserve requirements, reconsider the perceived importance of money supply in implementing economic policy, include additional economic variables in economic policy objectives, and consider a longer time horizon.

Conclusions regarding the economic policies of the Russian Federation Central Bank are to consider a longer time horizon as advocated by the macrofinance model, with a primary objective of creating liquid, efficient and credible capital markets.

Figure 1 UNITED STATES ONLY

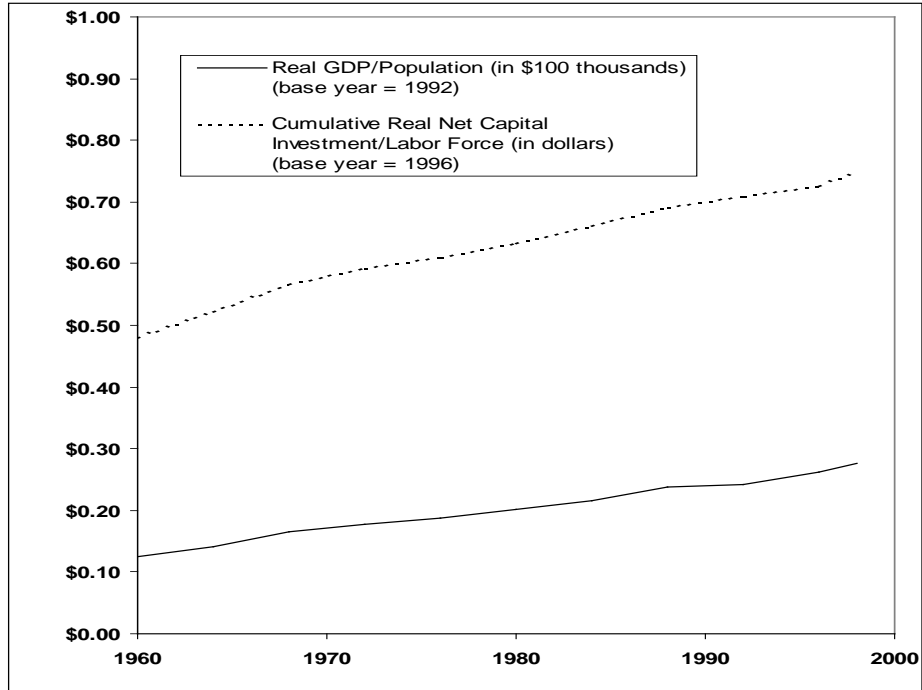


Figure 2 UNITED STATES ONLY

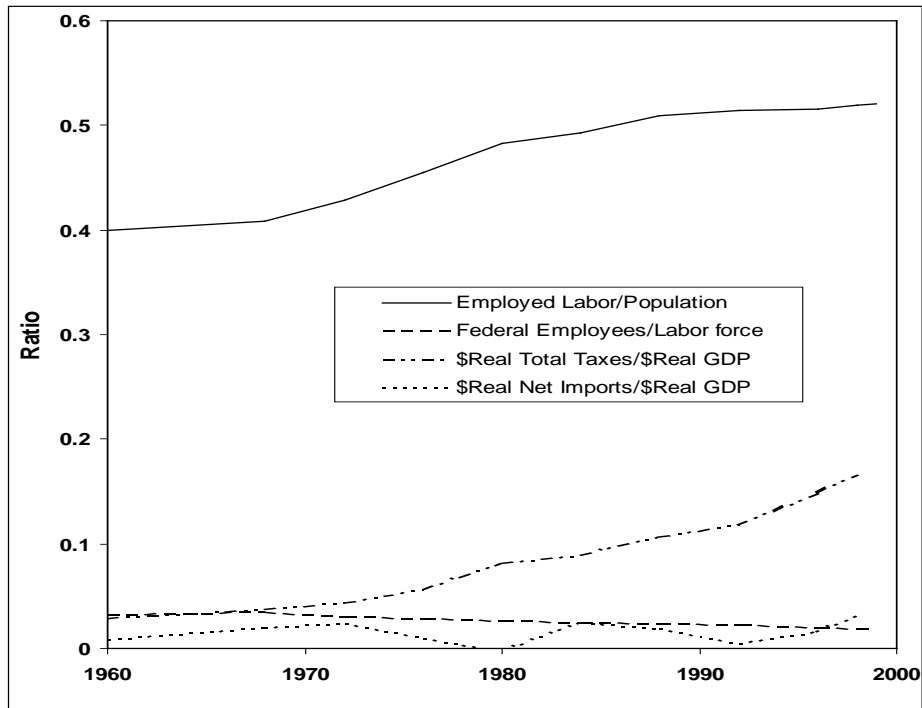


Figure 3 RUSSIAN FEDERATION AND THE UNITED STATES

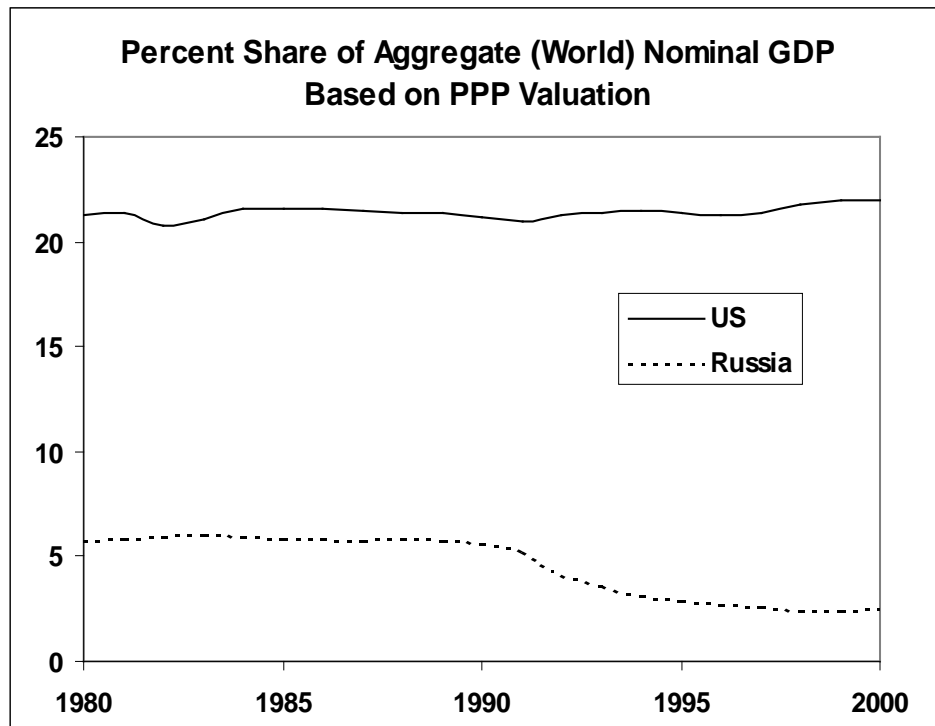
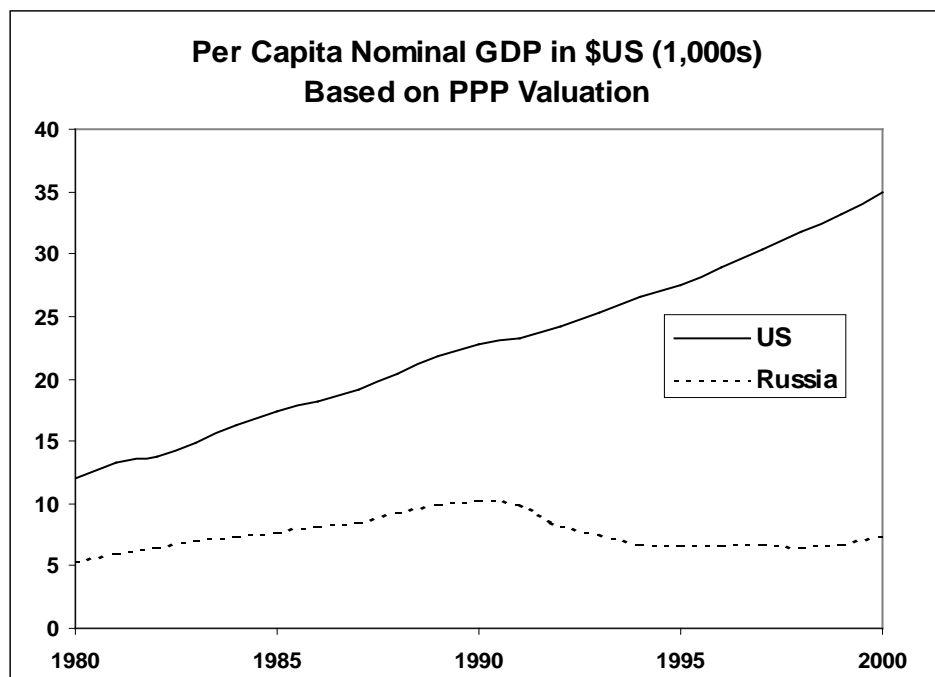


Figure 4 RUSSIAN FEDERATION AND THE UNITED STATES



References:

Alberro, Jose (1981) "The Lucas Hypothesis on the Philips Curve: Further International Evidence", *Journal of Monetary Economics*, Vol. 7, pp. 239-50.

Arka News Agency (2000) "Tigran Sarkissyan: Central Bank of Armenia Plans to Pursue a More Expansive Monetary-Credit Policy in 2001" Galina Davidyan, ed., in bulletin 'Business and Privatization #93, November 30, www.arka.am/eng/interview/exc8.html.

Barro, Robert J. (1976) "Unanticipated Money Growth and the Role of Monetary Policy", *Journal of Monetary Economics*, 2, pp. 1-32.

Barro, Robert J. (1977) "Unanticipated Money Growth and Unemployment in the United States", *AER*, Vol. 67, # 2.

Barro, Robert J. (1978) "Unanticipated Money, Output, and the Price Level in the United States", *Journal of Political Economy*, Vol. 86, # 4.

Barro, Robert J. and Rush, Mark (1980) "Unanticipated Money and Economic Activity", *Rational Expectations and Economic Policy*, Ed. Stanley Fischer. The University of Chicago Press.

Barro, Robert J. (1981) "Money, Expectations, and Business Cycles: Essays in Macroeconomics", Academic Press.

CBA, Central Bank of Armenia (2002) Monetary Policy Introduction, Regulation "Coordination of Activities of the Monetary and Financial Commission of the CBA and the Budget Commission of the MoFE, Publications and Statistics, The Risks in Implementing the Monetary Policy Program, <http://www.cbe.am/public/prg/risk.pdf>

Fischer, Stanley (1980) "On Activist Monetary Policy with Rational Expectations", *Rational Expectations and Economic Policy*, Ed. Stanley Fischer, The University of Chicago Press.

Friedman, Benjamin (1999) "The Future of Monetary Policy: The Central Bank as an Army of Only a Signal Corps?", *Internal Finance* 2:3, pp. 321-338.

Friedman, Milton (1968) "The Role of Monetary Policy", *AER*, Vol. 58, pp. 1-17.

Gaider, Yegor (1997) "Applied Economics in Action; The IMF and Russia", The International Monetary Fund, pp. 13-16.

Kharas, Homi, Pinto, Brian and Ulatov, Sergei (2001) "An Analysis of Russia's 1998 Meltdown: Fundamentals and Market Signals", *Brookings Papers on Economic Activity*, Vol. 1, pp. 4-5.

Kretzmer, Peter E. (1989) "The Cross-industry Effects of Unanticipated Money in an Equilibrium Business Cycle Model", *Journal of Monetary Economics*, Vol.23, #2, pp. 275-96.

Kormendi, R.C. and Meguire, P.G. (1984) "Cross-regime Evidence of Macroeconomic Rationality", *Journal of Political Economy*, Vol.92, pp. 875-908.

Lucas, Robert E. (1972) "Expectations and the Neutrality of Money", *Journal of Economic Theory*, 4, pp. 113-124.

Lucas, Robert E. (1973) "Some International Evidence on Output-Inflation Tradeoffs", *AER*, Vol. 63, # 3.

Mishkin, Frederic S. (1983) "A Rational Expectations Approach to Macroeconometrics: Testing Policy Ineffectiveness and Efficient-Markets Model", The University of Chicago Press.

Mohabbat, Khan A. and Al-Saji, Amer K. (1990) "Anticipated and Unanticipated Money Growth and the Rate of Unemployment in Italy", *Scienze Deconmiche E Commercial*, Anno XXXVII, # 10-11.

Muth, John (1961) "Rational Expectations and the Theory of Price Movements", *Econometrica*, Vol. 29, # 3 (July 1961).

Phelps, Edmund S. (1972) "Inflation Policy and Unemployment Theory: The Cost-Benefit Approach to Monetary Planning", Norton.

Prokofieva, Lidia and Terskikh, Lolita (1998) "Standards of Living and Family Structure in a Period of Social Transformation Russia in the 1990s", *Population: An English Selection*, Vol. 10, Issue 2, pp. 483-494, JSTOR.

Russian European Center for Economic Policy (RECEP) (1999) "Russian Economic Trends; Banking Sector", European Commission, Peter Westin, ed., ISSN 0967-0793, pp. 83-93.

Sargent, Thomas J. and Neil Wallace (1975) "Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule", *Journal of Political Economy*, Vol. 83, # 2.

Sellon, Gordon H. and Weiner, Stuart E. (1996) "Monetary Policy Without Reserve Requirements: Analytical Issues", Vol. 81, # 4, pp. 5-24.

Smith, Adam (1776) "The Wealth of Nations", Modern Library, Inc., New York, 1776.

The Economist, (2000) "The Russian Economy; Boom and Gloom", Vol. 357, #8198, p. 97.

The Economist (March 2001) "Cash in Your Chips", Vol. 358, # 8213, p. 76.

The Economist (April-May 2001) "Banks in Central Europe; The Banks that Don't Lend", Vol. 359, Number 8219, p. 77.

The Economist (July 2001) "A Survey of Russia", Vol. 360, Number 8231, pp. 1-16.

World Bank (2002) "Russian Economic Report", January, Number 2, pp. 1-13.