The Roller Coaster of the Russian Economy: A New Test of the Basic Mechanics

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It pays not to pay your bills. The truth of this statement is self-evident in the short run only. In the long or medium run, they will come after you, cut off your supplies, and seize your assets. But what if they won't come after you? Better yet, what if you can make the government pay your bills? Then (moral considerations aside), it pays not to pay your bills and to make the government pay. Some people actually do this in the U.S., for example, federal employees who charge personal purchases to a government credit card. The Russian enterprise network operates on the same principle.

This article revisits this operation. The new and revised data released in April-June 2003 by the Russian State Committee on Statistics give us an opportunity to put to a new test the basic relationships in the Russian economy.[1] The new data inform new tests on how this operation contributed to the Great Contraction of 1992-98 and how its accidental suppression by the Central Bank in late 1998 led to a partial recovery. Tables 1 through 4 summarize the data. Figures 1 to 11 submit the basic tests of empirical regularities.

An Operational Background

Chapter 1 of *From Predation to Prosperity* dissected the operation of the new economic system. Chapter 2 christened it Enterprise Network Socialism and laid out its origins. Chapter 2 also compared different experiences in 42 post central-plan countries. Central planning constituted a unified operation, a veritable nation-enterprise. Abolition of central planning, liberalization, and privatization in Russia in early 1992 set a unified network of enterprises free—free to charge the government. The enterprise network converts trade credit into a subsidy operation. Enterprises issue overdraft invoices in excess of cash flow available per regular payment period of about one month. Payments fall into arrears. The average length of trade payments expanded to about four months during 1992-98 and shortened to under three months during 1999-2002. Arrears create the payment jam. Its effect is similar to a continuous national strike. It makes the government face the supply chain breaking down and the tax base shrinking. The government is forced to allow enterprises to finance payment arrears by taking a subsidy in the form of non-remittance of taxes collected from consumers and withheld from workers. When the government needs taxes remitted, it has to monetize remittance by printing money and letting banks issue and roll over credit to enterprises. Chapter 1 dubbed this financing mechanism the self-enforceable tax subsidy. This unique subsidy is taken, not given. It is forced by the enterprise network on the symbiont government. The enterprise network

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[1]The latest tables are available at the Russian State Committee on Statistics' web site at
http://www.gks.ru/scripts/free/1c.exe?XXXX19F.2.1/000330R . The annual series are at
http://www.gks.ru/scripts/free/1c.exe?XXXX19F.2.1/000040R and the quarterly data are at
http://www.gks.ru/scripts/free/1c.exe?XXXX19F.2.1/000080R and
http://www.gks.ru/scripts/free/1c.exe?XXXX19F.2.1/000100R .

takes over fiscal and monetary policy and becomes the other government.

An accidental de-liberalization in late 1998 partially restored the fiscal and monetary power of the government. The Central Bank mandated repatriation of 75 percent of export revenues and their sale for rubles. The reason for a new control of the capital account was servicing foreign debt. The unintended result was a virtuous cycle: Enterprises with repatriated earnings had to remit more taxes. This cut the tax subsidy. To reduce forced remittance of taxes enterprises paid off some trade arrears to show lower cash balances. This eased the payment jam. This partly disabled enterprises from enforcing tax non-remittance and monetization. This, in turn, reduced incentives to build up arrears.

The dramatic fiscal turns of 1992-98 and 1999-2002 correspond to the roller coaster of the Russian economy:

Period	Cumulative change of GDP
1992-1998	-39.4%
1999-2003	+28.2%
1992-2003	-22.3%

Gross Domestic Product (GDP) contracted by almost 40 percent during 1992-98. It recovered nearly half of the losses in 1999-2002. By 2003, GDP stood at 78 percent of its level in 1991.

Chapter 1 of *From Predation to Prosperity* and subsequent articles (e.g., "The Secret of Russia's Economic Growth" and "New Data Confirms the Basic Relationships in the Russian Economy") submitted a unified explanation of these developments. Payment arrears between enterprises force subsidies from the government. The more enterprises succeed at wringing the subsidy the more overdraft invoices they issue in order to build up arrears. The rest is a mechanical sequence. Overdraft invoices carry price increases. This reduces real spending during each given period of time, which expresses itself in payment arrears. Payments stretch out. It takes more time to buy the same bundle of output. Less output is produced per year. Reduction of real spending contracts the economy. Conversely, the more enterprises are forced to pay off arrears, the less subsidy they can extract and the less overdraft invoices they issue. This checks price increases and the buildup of arrears. It takes less time to buy the same bundle of output. More output is produced per year. This fosters economic recovery. The buildup of payment arrears suppressed output in 1992-98. Weakening of this operation in 1999-2002 partly recovered output.

New updates and revisions of the data in April-June 2003 render an ideal material for testing this operational description. A sharper image of the Russian economic roller coaster emerges from the new data. Revisions of the GDP series reveal sharper annual fluctuations than reported earlier. Columns 5 and 6 in table 1 and the blue curve of the GDP index in figures 1 to 3 incorporate these revisions and add the data for 2002. The blue curve of the GDP index punctuates annual variation. The highlights include a rapid contraction in 1992-94, its deceleration in 1995-96, a one-year upward reversal in 1997 within the multi-year downward trend, a resumption of the GDP fall in 1998, an upturn in 1999, a growth acceleration in

Table 1

The Basic Data: The Money Stock, Receivables, and Output, Russia, 1990-2002

Year	Monetary aggregate M2 (billion rubles)	Enterprise receivables (billion rubles)	The ratio of M2 to receivables, year-end (percent)	Growth rate of real GDP	Index of real GDP (1991=100)
1990	n.a.	n.a.	556.1	-3.0	105.3
1991	0.456	0.082	656.2	-5.0	100.0
1992	0.958	0.146	149.0	-14.5	85.5
1993	6.4	4.3	92.2	-8.7	78.1
1994	33.2	36.0	79.5	-12.5	68.3
1995	97.8	123.0	76.3	-4.1	65.5
1996	220.8	289.3	52.1	-3.6*	63.1
1997	288.3	553.2	55.3	1.4*	64.0
1998	374.1	677.0	37.4	-5.3*	60.6
1999	448.3	1,198.2	48.2	6.4*	64.5
2000	704.7	1,462.6	66.5	10.0*	71.0
2001	1,144.4	1,721.4	78.4	5.0	74.5
2002	1,602.6	2,045.1	93.5	4.3	77.7
2003	2,119.6	2,267.7			

* revised in 2004

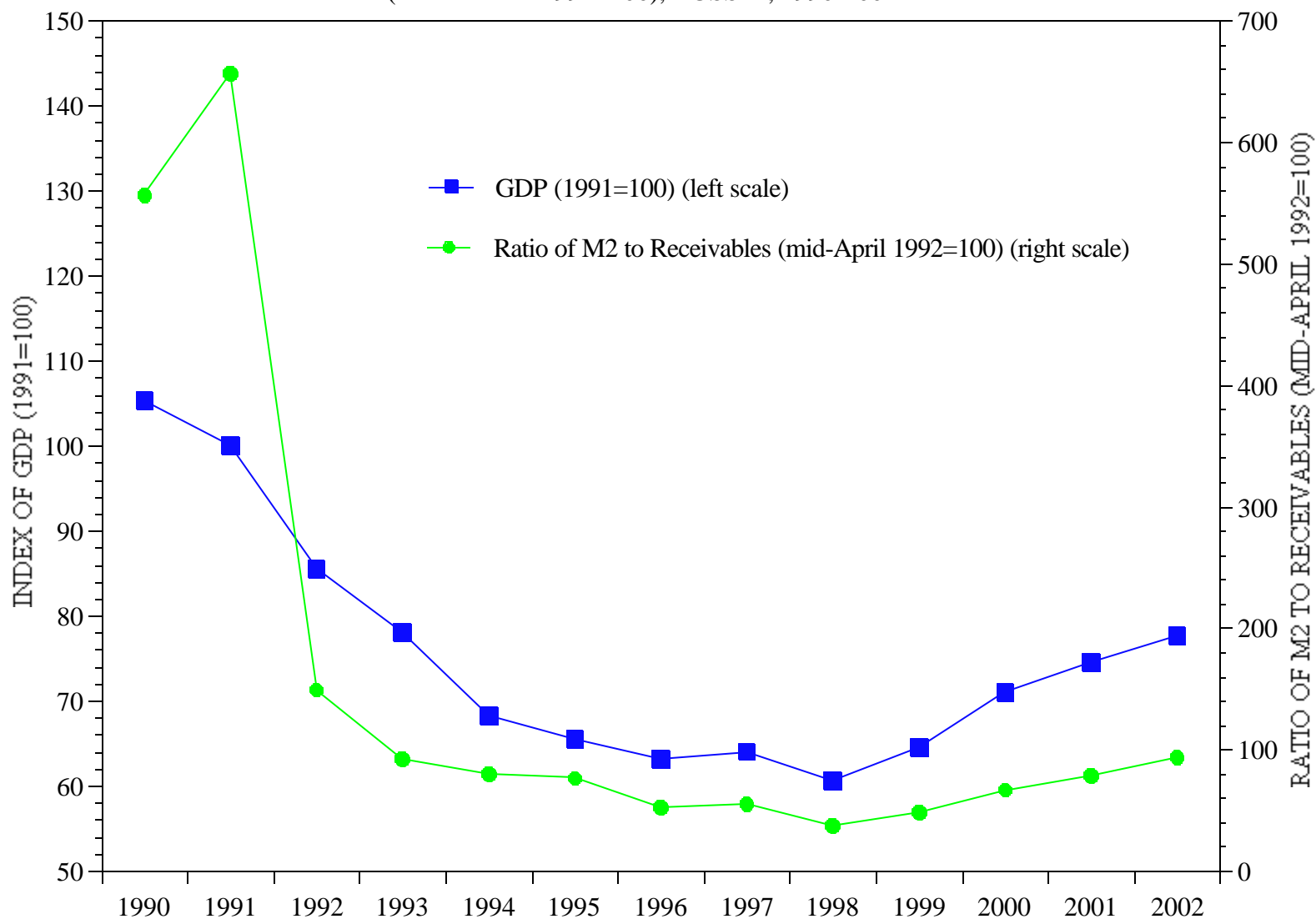Note: All nominal values are denominated in billion 1998 rubles

Sources:
Money: Central Bank of Russia
Receivables and GDP: Russian State Committee on Statistics, various releases

FIGURE 1

INDEXES OF GROSS DOMESTIC PRODUCT (GDP) (1991=100) AND OF THE RATIO OF M2 TO RECEIVABLES (YEAR-END)
(MID-APRIL 1992=100), RUSSIA, 1990-2002

Notes: 1. The difference between the scales of the two vertical axes indicates the change in the velocity of money circulation and other factors

 2. In mid-April 1992, both M2 and receivables converged to R1.45 billion and reached the 1:1 ratio. This makes it convenient to use the actual values of M2 and receivables
 and their ratios at the end of each year during 1990-2002 as equivalent to the index with the basis of 100 in mid-April 1992. If another date is chosen to serve as the basis 100
 for the index, only the values on the right scale and on the green curve will change proportionally but the contour of the green curve will remain the same
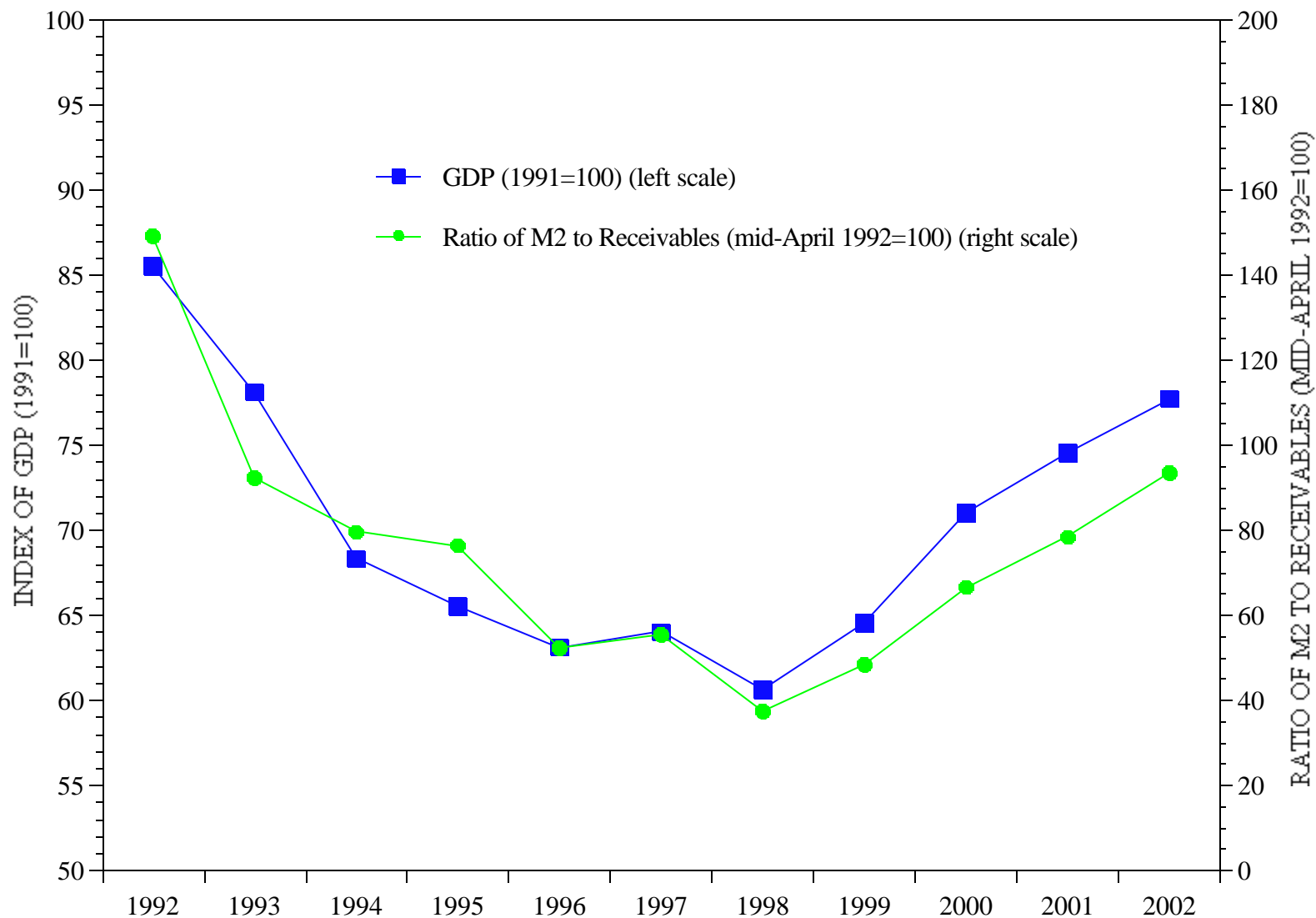
Sources: Gross Domestic Product and enterprise receivables: Russian State Committee on Statistics

 The monetary aggregate M2: Central Bank of Russia

 The data are reproduced in table 1

FIGURE 2

INDEXES OF GROSS DOMESTIC PRODUCT (GDP) (1991=100) AND OF THE RATIO OF M2 TO RECEIVABLES (YEAR-END),
(MID-APRIL 1992=100), RUSSIA, 1992-2002

Notes: 1. The difference between the scales of the two vertical axes indicates the change in the velocity of money circulation and other factors
2. In mid-April 1992, both M2 and receivables converged to R1.45 billion and reached the 1:1 ratio. This makes it convenient to use the actual values of M2 and receivables and their ratios at the end of each year during 1990-2002 as equivalent to the index with the basis of 100 in mid-April 1992. If another date is chosen to serve as the basis 100 for the index, only the values on the right scale and on the green curve will change proportionally but the contour of the green curve will remain the same
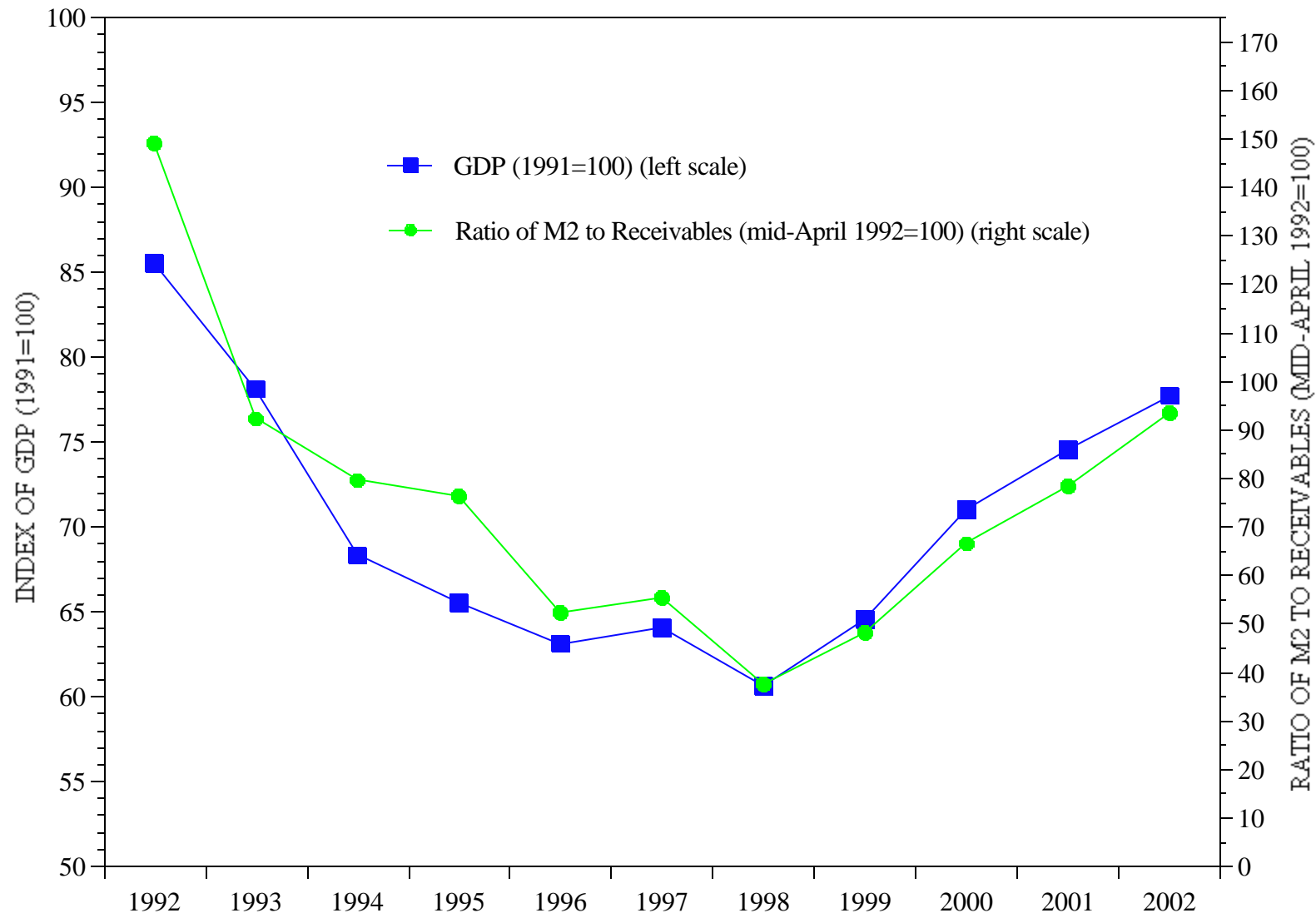
Sources: Gross Domestic Product and enterprise receivables: Russian State Committee on Statistics
The monetary aggregate M2: Central Bank of Russia
The data are reproduced in table 1

FIGURE 3

INDEXES OF GROSS DOMESTIC PRODUCT (GDP) (1991=100) AND OF THE RATIO OF M2 TO RECEIVABLES (YEAR-END),
(MID-APRIL 1992=100), RUSSIA, 1992-2002

Notes: 1. The difference between the scales of the two vertical axes indicates the change in the velocity of money circulation and other factors
2. In mid-April 1992, both M2 and receivables converged to R1.45 billion and reached the 1:1 ratio. This makes it convenient to use the actual values of M2 and receivables
and their ratios at the end of each year during 1990-2002 as equivalent to the index with the basis of 100 in mid-April 1992. If another date is chosen to serve as the basis 100
for the index, only the values on the right scale and on the green curve will change proportionally but the contour of the green curve will remain the same

Sources: Gross Domestic Product and enterprise receivables: Russian State Committee on Statistics
The monetary aggregate M2: Central Bank of Russia
The data are reproduced in table 1

2000, and a steady recovery in 2001 and 2002. Together, the great contraction of 1992-98 and a partial recovery of 1999-2002 make up a pronounced convex shape of the index curve with annual fluctuations. This makes an excellent testing ground. Figures 1-5 relate the blue curve of the GDP path to the green curve of the buildup and deceleration of arrears.

The output roller coaster and the buildup and deceleration of arrears

There cannot be greater payments in the economy than there is spending. Overdraft invoices issued in excess of available cash flow cannot be paid off on time and fall into arrears because there is not enough cash flow per designated period (say, per month). What enterprises view as cash flow, for the entire economy is spending. It is the money stock times its velocity of circulation. The basic relationship in the Russian economy laid out in Chapter 1 of our book can be summarized as follows:

1.   Overdraft invoices do not accompany more goods which the existing cash flow did not demand. Overdraft invoices merely raise prices of the goods in shipments and then fall into arrears. Figure 6 tests this proposition.

2.   Given the increased price level, expressed in the stock of arrears, payments stretch out. The existing cash flow can buy fewer goods per month and per year and producers make less output per month and per year. Figures 1-5 test this proposition.

On the books, overdraft invoices increase nominal income as if spending increased—but it did not. Cash flow did not increase. Genuine spending did not increase. In terms of spending, this process can be viewed as counterfeit. Additional nominal volume of receivables acts as an increase in money velocity which is counterfeit velocity, unrelated to the existing cash flow. Overdraft invoices operationalize fiscal and monetary expectations under this system. Counterfeit velocity derives from expectations of the forthcoming subsidy from fiscal (tax non-remittance) and monetary (Central Bank monetization of bank credit to enterprises) channels. This counterfeit velocity will self-destruct in five seconds when receivables fall into arrears. But real (deflated) spending contracts due to price increases inherent in overdraft invoices. The same volume of spending extends over time and output contracts. In short, the decline in real spending extends the demand over time. This decreases the demand per period of time and then the supply. This mechanism goes in reverse when overdraft invoicing is reduced, price increases curbed, real spending increases, and cash flow (spending) can demand more output per month and per year. Given the ample idle capacity, the economy moves to the recovery path.

Figures 1-5 with the supporting evidence in figure 6 chart these movements. Figure 6 captures the initial impact of overdraft invoices acting as counterfeit velocity. In the simplest way possible, without any lags and arbitrary choices about them, figure 6 compares for each year during 1992-2002 the annual indexes of receivables and the annual price index. In this and other figures the stock of receivables represents overdraft invoices which have fallen into arrears. Since early 1992 and thereafter, through the first quarter of 2003, the average length of payments between two and four months qualifies the total stock

FIGURE 4

QUARTERLY INDEXES OF GROSS DOMESTIC PRODUCT (GDP) (QI 1995=100) (NOT SEASONALLY ADJUSTED)
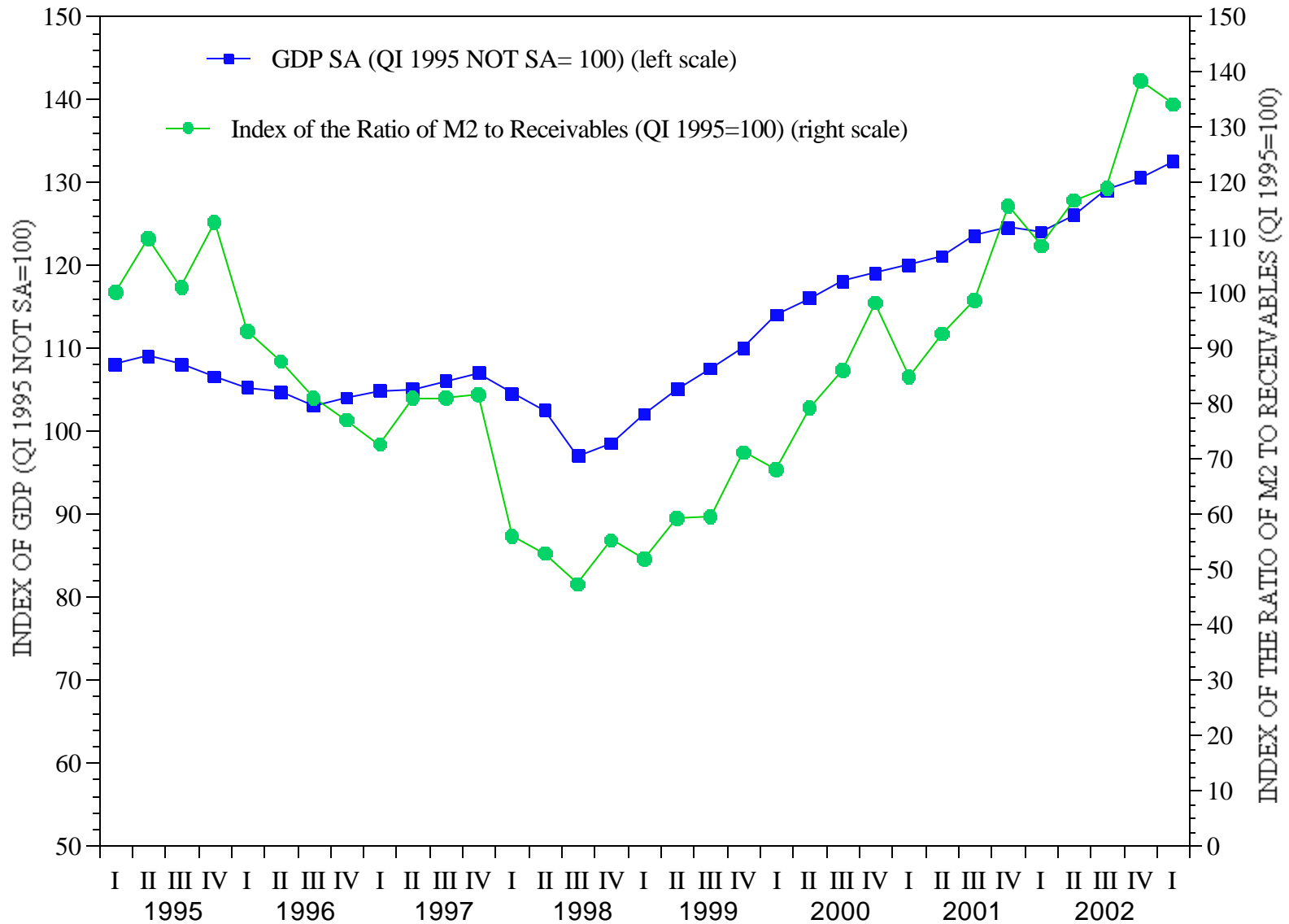AND OF THE RATIO OF M2 TO RECEIVABLES (QUARTER-END, QI 1995=100), RUSSIA, 1995-2003
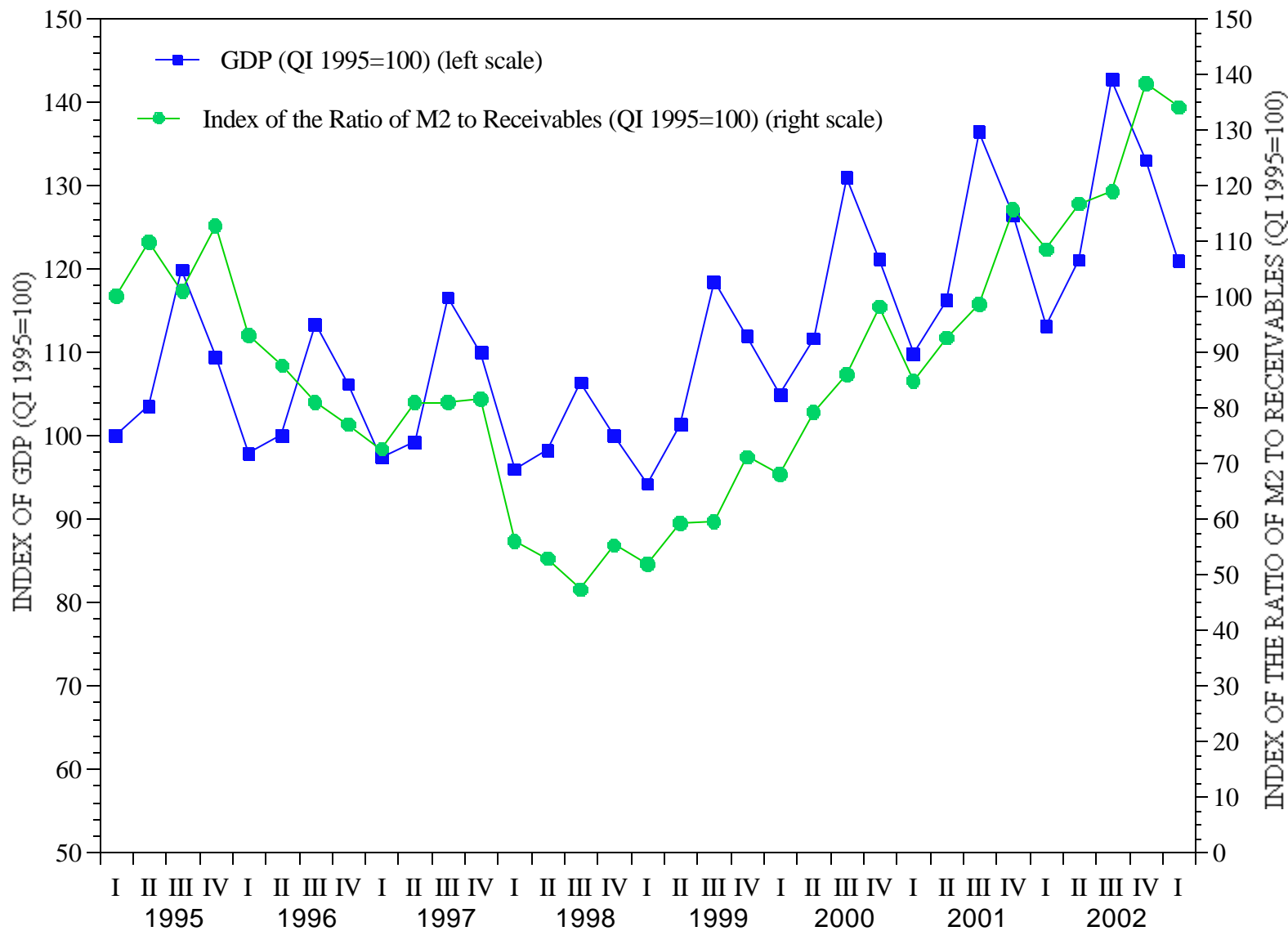
Notes: The difference between the scales of the two axes indicates the change in the velocity of money circulation and other factors

Sources: Gross Domestic Product and enterprise receivables: Russian State Committee on Statistics

          The monetary aggregate M2: Central Bank of Russia

FIGURE 5

QUARTERLY INDEXES OF GROSS DOMESTIC PRODUCT (GDP) (SEASONALLY ADJUSTED) (QI 1995 NOT SA=100)
AND OF THE RATIO OF M2 TO RECEIVABLES (QUARTER-END, QI 1995=100), RUSSIA, 1995-2003

Notes: 1. The difference between the scales of the two axes indicates the change in the velocity of money circulation and other factors

2. The basis for the index of quarterly GDP is the GDP in the first quarter of 1995 not seasonally adjusted

Sources: Gross Domestic Product and enterprise receivables: Russian State Committee on Statistics

The monetary aggregate M2: Central Bank of Russia

FIGURE 6
RECEIVABLES AND CONSUMER PRICES, ANNUAL INDEXES,
RUSSIA, 1992-2002
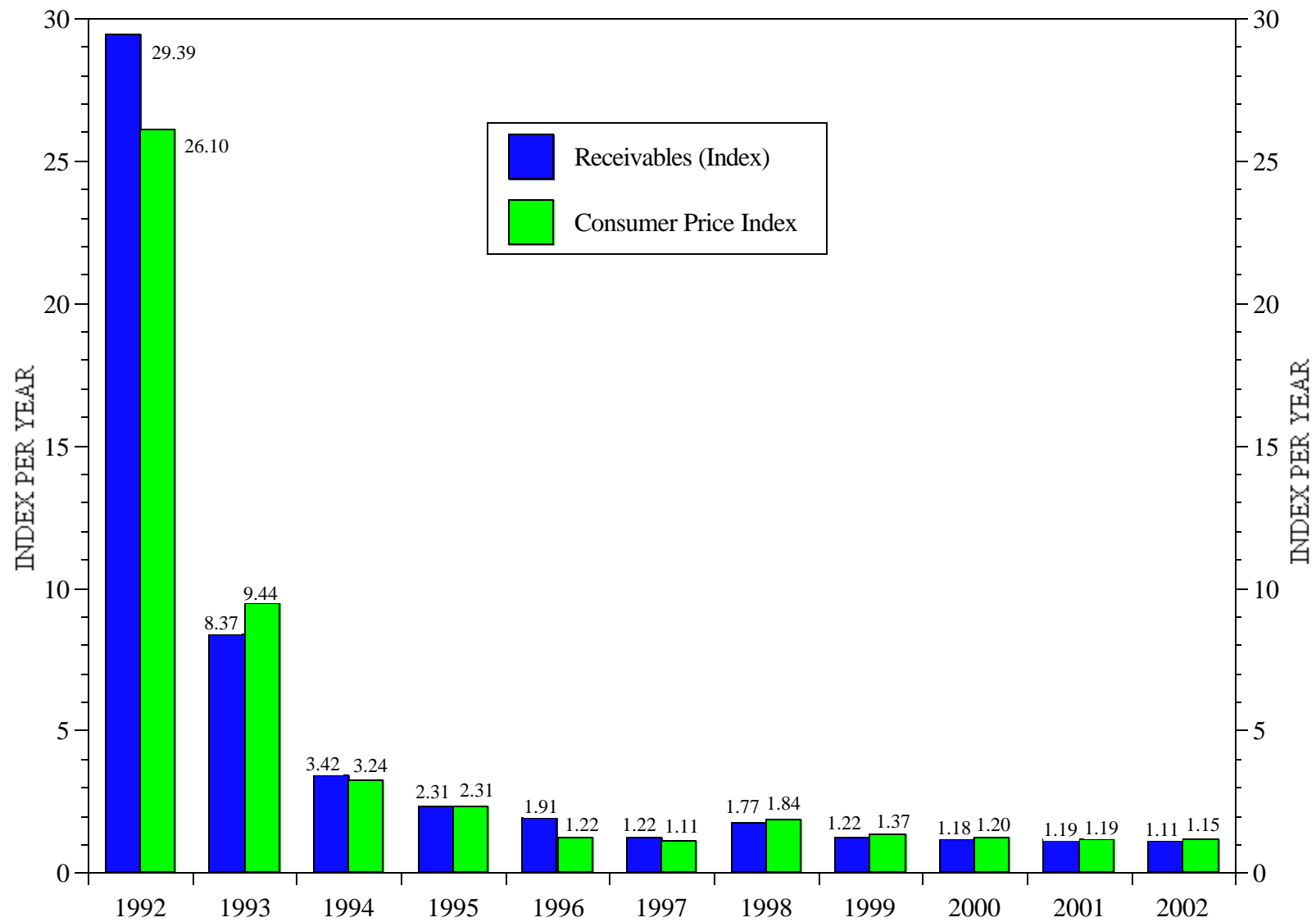
Note: Receivables are an accounting variable which analytically stands for overdraft invoices fallen into arrears
Source: Russian State Committee on Statistics

of receivables as arrears. It is preferable to use the producer price index or the wholesale price index in the context of trade credit between enterprises. But these indexes in Russia are available for individual sectors only, not for the entire economy. The Consumer Price Index (CPI) serves in figure 6 as an imperfect but most likely close substitute. One can readily observe that the index of receivables and the price index exhibit a close positive relationship year by year.

Russia went through the periods of extreme inflation in 1992-93, high inflation in 1994-95, and relatively low inflation in 1996-97, then saw a high inflation outburst in 1998 and a gradual reduction towards a relatively low inflation levels during 1999-2002. Figure 6 shows that all these movements were matched by the annual movements in the index of receivables both in direction and in magnitude. A positive correlation between the two variables is very close. A linear regression accounts for 99 percent of the variation and all years except 1993 are on the regression line, but the sample is too small. It is merely an accounting matter that invoices originate price increases at the wholesale level.

It is also an accounting matter that arrears carry price increases further, to where payments and spending are concerned. This accounting matter and a close correlation between arrears and the price level in figure 6 allow us to substitute arrears for the price level when we construct a variable of real spending in Russia. The object of this substitution is to examine the independent influence of counterfeit velocity (overdraft invoices fallen into arrears) on the path of output. In this spirit, the green curve in figures 1-5 combines the money stock M2 in the numerator and the stock of receivables as the denominator. This ratio of money to arrears is expressed as an annual (in figures 1-3) or quarterly (in figures 4-5) index. This index is simply a time path from the same benchmark. The green curve is expressed in the index form to compare over time with the index of GDP on the blue curve. The difference in scales between the index of GDP and the index of the ratio of money to arrears in figures 1-5 creates a scalar factor. This scalar factor accounts for the index of velocity of money circulation and for independent influences of the price index which are unrelated to overdraft invoicing. Within this scalar frame of the velocity index and the residual price index, the green curve shows the path of real (deflated) spending due to the money stock and overdraft invoicing.

One can think of the green curve as the special index of real spending under counterfeit velocity. The latter self-destructs when overdraft invoices fall into arrears. The rest is straightforward. When overdraft invoices increase relative to cash flow, arrears in the denominator of the green curve increase relative to the money stock in the numerator, and the green curve goes down. Real spending declines, payments stretch out, output declines, and the blue curve of the GDP path should go down. The ratio of money to receivables declined during the period of 1992-98 from 656 to 37 and GDP contracted by 40 percent. When overdraft invoices increase less than cash flow, arrears in the denominator of the green curve decrease relative to the money stock in the numerator, and the green curve goes up. Real spending increases, output increases, and the blue curve of the GDP path should go up. In short, the buildup of arrears in the green curve brings it down and should take the blue curve of GDP down. Deceleration of arrears in the blue curve brings it up and should take the blue curve of GDP up.

Figures 1-5 submit evidence to test this mechanism. For the quarterly data in figures 4-5, the ratio of money to receivables in the first quarter of 1995 serves as the benchmark 100. The annual data in figures 1-3 conveniently use the actual values of the money stock M2 and the stock of receivables at the end of each year and their actual ratios. These annual ratios converge to the index with the benchmark 100 in mid-April 1992. At that time, both M2 and receivables grew to R1.45 billion (in denominated 1998 rubles) and their ratio reached 1:1. For accounting calculations, it is necessary to use the same starting date for the indexes of GDP and the ratio of money to receivables (in our case, the end of 1991), but for diagrammatic comparisons and correlations the choice of the benchmark value is immaterial. A different choice will change proportionally the values on the right scale of the vertical axis in figures 1-3 and the index values on the green curve. The contour of the green curve will remain the same. The relationship between the blue curve of the index of GDP and the green curve of the index of the ratio of M2 to receivables will remain the same. For informative and visual purposes, it is advantageous to plot the actual values of the second curve which can double as an index. The green curve in figures 1-3 is thus an index which depicts the actual path of how the ratio of money to receivables slides and recovers in parallel with GDP.

Figures 1 to 3 make annual comparisons of the two curves. Figure 1 covers the period from 1990 through 2002. Figures 2 and 3 focus on the post-central plan period of 1992-2002 using slightly different scales to compare the two variables. A greater scalar factor (4:1) in figure 2 fits better the period of the Great Contraction of 1992-98. A smaller scalar factor (3.5:1) in figure 3 fits better the period of the partial recovery in 1999-2002. Both plots are very similar and it may be pedantic to submit two figures.

Figures 4 and 5 harness the newly available quarterly GDP index from the first quarter of 1995 through the first quarter of 2003 against the quarterly index of the ratio of the money stock to receivables. Figure 4 employs the raw index of GDP, not seasonally adjusted (QI of 1995 = 100). This is suitable for comparing with the data on money and receivables which are also unadjusted. Figure 5 nevertheless utilizes the seasonally adjusted quarterly series (QI of 1995, not seasonally adjusted, serves as 100). This sacrifices short-term GDP fluctuations but sharpens the general shape of its roller coaster in a comparison with the path of the ratio of M2 to receivables.

The entire batch of figures 1-5 shows consistently that the buildup of arrears takes GDP down and deceleration of arrears takes GDP up. The blue curve of the GDP index and the green curve of the index of the ratio of M2 to receivables exhibit a close positive correlation from 1991 through 2002. This positive correlation holds for the annual data in figures 1 to 3 and for the quarterly data in figures 4 and 5. When the ratio of M2 to receivables declines over time, GDP contracts in a consistent proportion. When the ratio of M2 to receivables increases, GDP expands in a consistent proportion. This relationship holds for both the contraction period of 1992-98 and a recovery period of 1999-2002. It holds on the annual basis for the sharp GDP fall in 1992, for the rapid contraction in 1993-94, for a decelerated contraction in 1995-96, for a one-year upturn in 1997, for a resumed sharp decline in 1998, for an upturn in 1999, its sharp acceleration in 2002, and a decelerated recovery in 2001-2002.

In short, the green curve of the path of the ratio of money to receivables captures all economic ups

and downs, for each period and for each year. There is not a single exception to this positive correlation during 1991-2002. This annual positive correlation is readily visible under various scalar factors in figures 1 to 3. (A linear regression accounts for 85 percent of the annual variation, a quadratic-form regression accounts for 97 percent, but the sample is too small to make statistical claims). The quarterly data from the first quarter of 1995 through the first quarter of 2003 (not seasonally adjusted) exhibit a similar positive correlation in figure 4, either during the same quarter or with a one-quarter lag. The seasonally adjusted quarterly GDP data in figure 5 capture the general quarterly patterns. They include a decelerated contraction in 1995-96, an upturn in 1997, a sharp decline in 1998, and a recovery beginning in 1999, which accelerates in 2000 and decelerates in 2001-2003. The smoothed quarterly data broadly meet their match in the sharply fluctuating green curve of the path of the quarterly ratio of M2 to receivables. The path of overdraft invoices fallen into arrears corresponds to the entire roller coaster of Russian GDP in the long and short run.
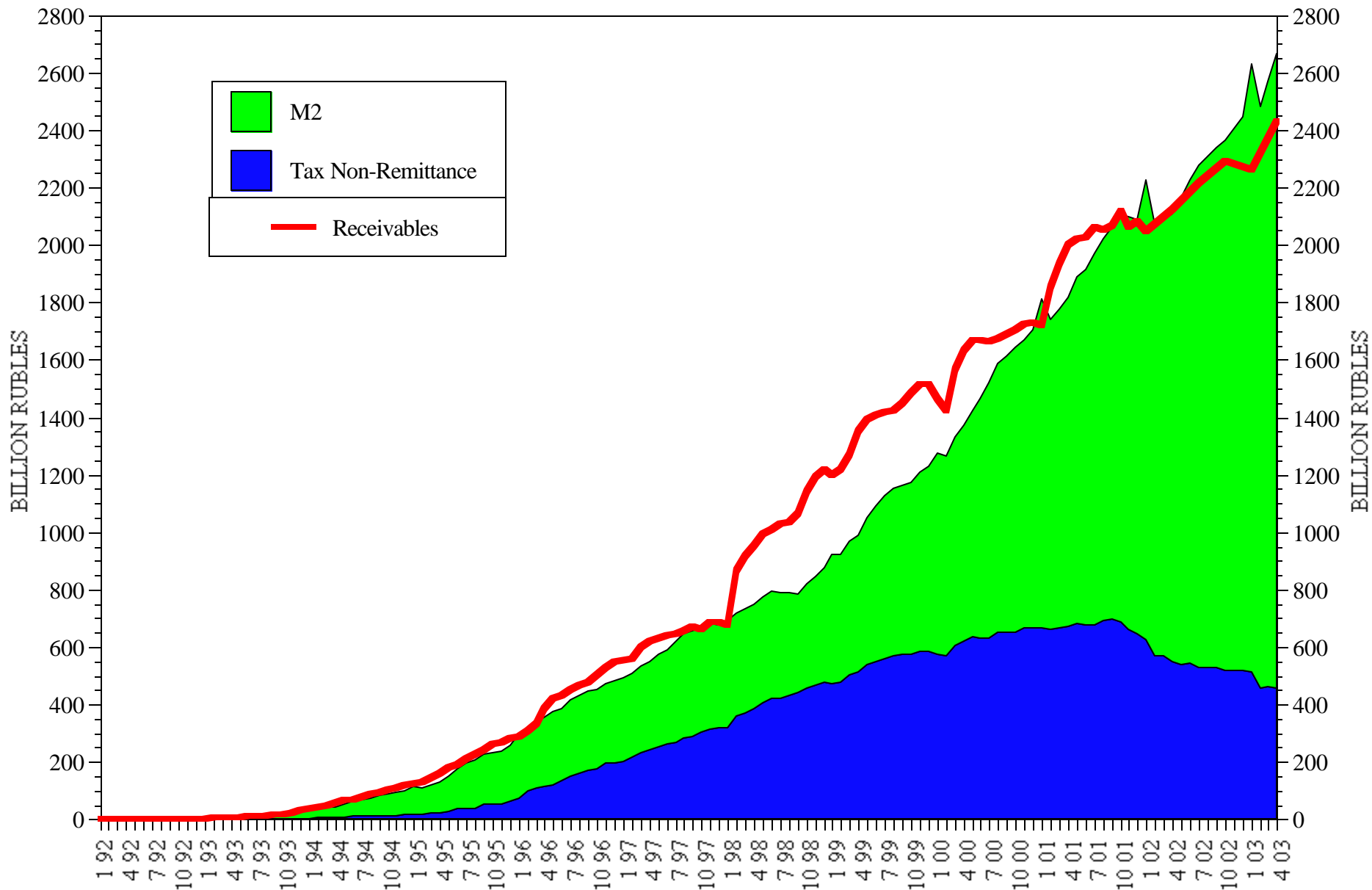
The self-enforceable tax subsidy

Overdraft invoices which fall into arrears exist because the enterprise network can use them to extract a commensurate subsidy. Figures 7 and 8 show on the monthly basis over the entire period from January 1992 through March 2003 that the stock of receivables in arrears commands the tax subsidy of a comparable amount extracted through various channels.

- Tax non-remittance is a major fiscal channel (there are also tax offsets and other fiscal arrangements). Enterprises collect taxes from workers (payroll and income taxes withheld from wages) and consumers (the value-added tax, excise taxes, economic rents on natural resources, etc.) but remit only a portion to the government and retain the residual.

- Monetization is the monetary channel. The money stock M2 stands for this subsidy in figures 7 and 8. It represents liquidity provided by the Central Bank to banks for credit to enterprises and multiplied by the banking system. Part of this credit represents rollover of non-performing loans and the other part, new loans. A very low deposit multiplier, 2.3 in June 2003 (M2 of R2,432 billion in relation to the monetary base of R1,050 billion) corresponds to a continuously low level of household deposits, which we discussed in detail in *Fixing Russia's Banks*. This singles out monetization by the Central Bank as the principal source of money creation and justifies treating the entire domestic money stock as an approximation of the enterprise subsidy through the monetary channel. (There are no continuous data for the money stock M1, which is a better measure of liquid assets. But since checkable deposits are very few in Russia, the difference between demand deposits and savings deposits is blurred, and the actual difference between the stocks of M1 and M2 is negligible).

- Enterprises use payroll arrears as a subsidy component. We did not include payroll arrears in figure 7 because their amount is relatively small in the overall picture and may not be visible in the diagram; for consistency we did not add payroll arrears in figure 8.

FIGURE 7

THE SELF-ENFORCEABLE TAX SUBSIDY: THE RELATIONSHIP BETWEEN ENTERPRISE RECEIVABLES,
TAX NON-REMITTANCE, AND MONEY, RUSSIA, 1992-2003

Note: All data are denominated in billion 1998 nominal rubles.

Sources: Receivables and tax non-remittance: Russian State Committee on Statistics.

Money: Central Bank of Russia.

FIGURE 8

THE SELF-ENFORCEABLE TAX SUBSIDY: THE RELATIONSHIP BETWEEN ENTERPRISE RECEIVABLES,
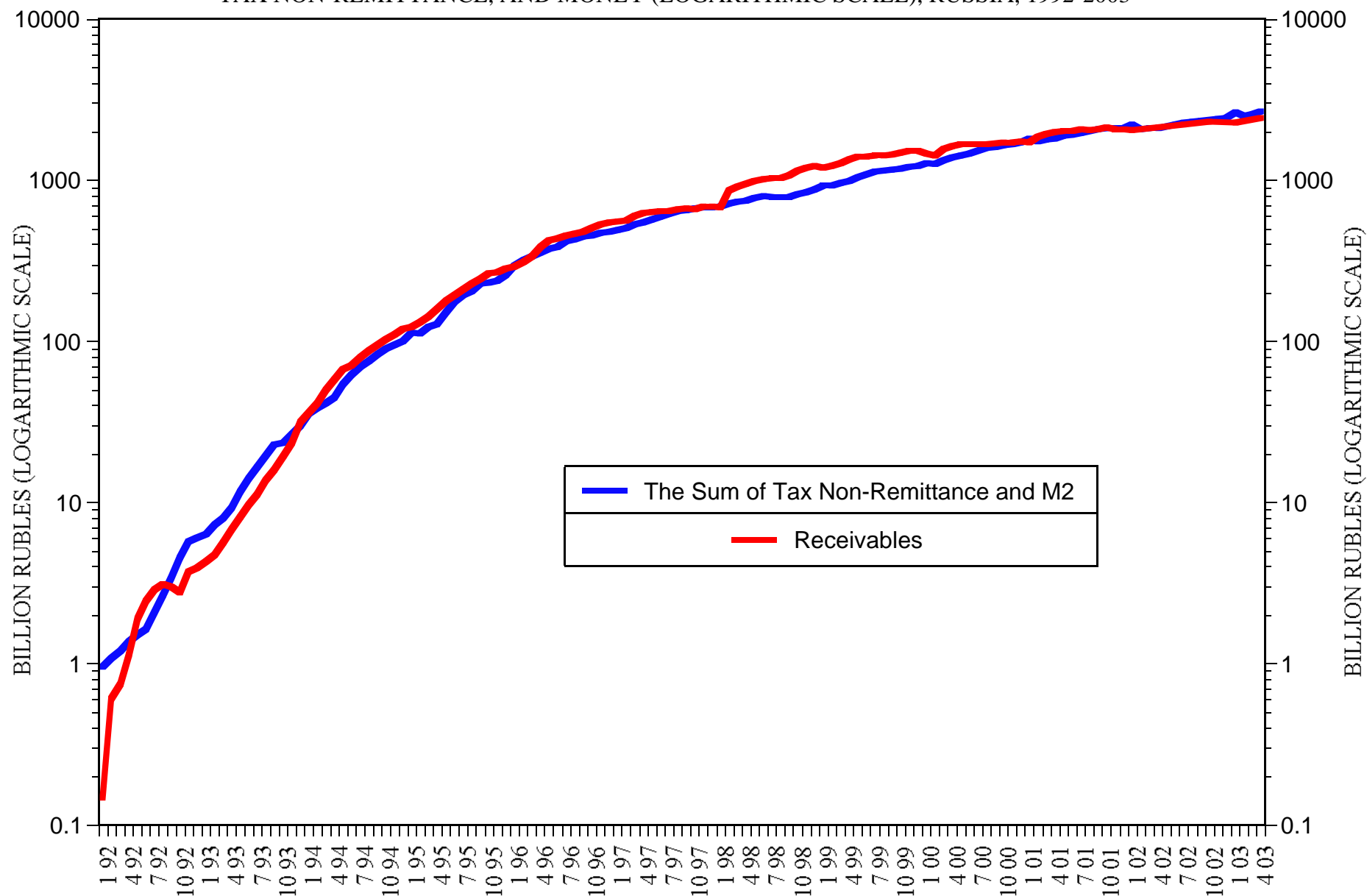TAX NON-REMITTANCE, AND MONEY (LOGARITHMIC SCALE), RUSSIA, 1992-2003

Note: All data are denominated in billion 1998 nominal rubles.

Sources: Receivables and tax non-remittance: Russian State Committee on Statistics.

Money: Central Bank of Russia.

It is more customary from the accounting standpoint to compare the flow of receivables with the flow of these subsidies in each given period. Column 3 of table 2, table 3, and table 4 compile the annual flow data for 1992-2002 and construct the statement of cash flows and the flow of funds account. However, subsidies from different channels are extracted with variable lags and do not necessarily match every month and every year the target claims embodied in overdraft invoices. The stock data on the accumulated arrears and subsidies over time in figures 7 and 8 smooths these lags. It is the final outcome that matters for the enterprise network (and for us as its observers). It has never been an objective of this subsidy extraction to secure regular monthly allowances resembling social security checks with the cost of living adjustments. The final outcome is that the subsidy extraction commensurate with the buildup of payment arrears is never far behind the target and systematically reaches and sometimes exceeds the subsidy target initiated by overdraft invoices. Figures 7 and 8 clearly show this.

Figures 7 and 8 are substantively identical. Their difference is presentational. The scale in figure 7 is linear, in figure 8 logarithmic. This alteration of scales helps visualize and put in perspective the entire period of 1992-2003. Because of high inflation during the period, the linear scale flattens the nominal amounts of receivables, tax non-remittance, and M2 in the early 1990s and obscures their relationship. The linear scale visually gives more exposure to the absolute increase in magnitudes compared with the rates of increase. This also makes the discrepancies and fluctuations in the early 2000s look larger than they are relative to those in the previous years. The logarithmic scale reveals two consistently interwoven curves of the subsidy target—the buildup of arrears—and the subsidy extraction—the sum of the two major subsidies, tax non-remittance and monetization transmitted through credit.

Figures 7 and 8 demonstrate that the basic fiscal relationship "**overdraft invoices = the tax subsidy**" holds consistently over time for the entire 11-year period, from the beginning of 1992 through the last data point we have, the end of the first quarter of 2003. This relationship is systemic and not temporary. It holds for both the period of a great buildup of arrears in 1992-98 and the period of its deceleration in 1999-2003. It holds both when tax non-remittance and monetization grew in tandem in 1992-98 and when tax non-remittance decelerated and declined while monetization increased steadily in 1999-2003.

The very mechanism of self-enforcement of the tax subsidy transpires from these figures.

1.   Receivables fallen into arrears have to be paid off lest they reach the point of economic and fiscal breakdown. The government has to tolerate tax non-remittance as the lesser of two evils, the greater being losing the tax base altogether should economic activity come to a standstill when all trade payments halt.

2.   Tax non-remittance periodically reaches dangerous fiscal levels and puts the government in a debt bondage. Figure 9 shows how tax non-remittance matched with the buildup of the unsustainable short-term government debt in 1995-98. (It also implies that, net of the tax subsidy, the

Table 2
Receivables and their Financing as a Share of GDP,
Russia, 1990-2002

Year	Enterprise receivables (billion rubles)	Increase in receivables (billion rubles)	GDP (billion rubles)	Financing of receivables as a percent of GDP (Imputing the tax subsidy on the accrual basis)
1990	n.a.	n.a.	0.644	n.a.
1991	0.082	0.064	1.399	4.6
1992	0.146	4.15	19.0	21.8
1993	4.3	31.7	171.5	18.5
1994	36.0	87.0	610.7	14.2
1995	123.0	166.3	1,428.5	11.6
1996	289.3	263.9	2,007.8	13.1
1997	553.2	123.8	2,342.5	5.3
1998	677.0	521.2	2,629.6	19.8
1999	1,198.2	264.4	4,823.2	5.5
2000	1,462.6	258.8	7,305.6	3.5
2001	1,721.4	323.7	9,039.4	3.6
2002	2,045.1	222.6	10,863.4	2.0
2003	2,267.7			

* revised in 2004

Note: All nominal values are denominated in billion 1998 rubles

Sources:
Receivables and GDP: Russian State Committee on Statistics, various releases

Table 3. Statement of Cash Flows, Nonfinancial Enterprises, Russia, 1992-2002 (in billion rubles)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Net income	5.6	40.8	80.4	250.6	125.0	174.0	-115.1	723.2	1190.6	1144.7	905.8
Profit and loss	4.9	34.6	52.2	168.2	13.4	39.5	-235.8	495.7	675.4	605.0	282.4
Capital transfers	0.7	6.2	28.2	82.4	111.6	134.5	120.7	227.5	515.2	539.7	623.4
- Net receivables	5.0	38.6	106.7	211.5	300.6	183.5	695.9	455.7	453.1	760.2	422.3
+ Net trade and related payables	5.6	35.4	111.5	239.6	287.9	181.8	881.9	538.6	530.3	760.8	715.3
+ Net tax and payroll payables	0.14	3.6	15.5	69.2	163.5	117.2	182.3	64.8	83.9	-45.1	-113.7
Net tax arrears	0.11	2.9	12.1	60.0	128.3	113.2	157.9	98.1	95.9	-43.3	-114.4
Net payroll arrears	0.03	0.7	3.45	9.2	35.2	4.0	24.4	-33.3	-12.0	-1.8	0.7
Net cash from operations	6.3	41.2	100.7	347.9	275.8	289.5	253.2	870.9	1351.7	1100.2	1085.1
- Capital expenditures	2.0	17.8	80.5	208.8	300.4	324.2	329.3	556.4	908.9	1282.8	1328.4
- Financial investment	0.1	0.7	9.3	17.7	30.4	74.7	135.2	255.3	361.9	479.1	550.0
- Investing activities	2.1	18.5	89.8	226.5	330.8	398.9	464.5	811.7	1270.8	1761.9	1878.4
+ Bank and other loans	1.0	9.7	33.8	46.3	32.4	40.9	349.3	194.6	256.4	863.4	646.9
+ Financing activities	1.0	9.7	33.8	46.3	32.4	40.9	349.3	194.6	256.4	863.4	646.9
Net cash per period	0.8	4.9	9.8	3.9	19.7	13.3	35.0	75.5	61.3	105.8	212.8
Discrepancy	4.4	27.5	34.9	163.8	-42.3	-81.8	103.0	178.3	276.0	95.9	-359.2

Source: Derived and calculated from Russian State Committee on Statistics, various releases

Table 4. The Flow of Funds, Nonfinancial Enterprises, Russia, 1992-2002 (in billion rubles)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Profit and loss	4.9	34.6	52.2	168.2	13.4	39.5	-235.8	495.7	675.4	605.0	282.4
Capital transfers	0.7	6.2	28.2	82.4	111.6	134.5	120.7	227.5	515.2	539.7	623.4
Gross saving	5.6	40.8	80.4	250.6	125.0	174.0	-115.1	723.2	1190.6	1144.7	905.8
Gross investment	1.2	13.3	45.5	86.8	167.3	255.8	-218.1	544.9	914.6	1048.8	1265.0
Capital expenditures	2.0	17.8	80.5	208.8	300.4	324.2	329.3	556.4	908.9	1282.8	1328.4
Net financial investment	-0.8	-4.5	-35.0	-122.0	-133.1	-68.4	-574.4	-11.5	5.7	-234.0	-63.4
Net acquisition of financial assets	5.9	44.2	125.8	233.1	350.7	271.5	866.1	786.5	876.3	1345.1	1185.1
Deposits and currency	0.8	4.9	9.8	3.9	19.7	13.3	35.0	75.5	61.3	105.8	212.8
Other financial investment	0.1	0.7	9.3	17.7	30.4	74.7	135.2	255.3	361.9	479.1	550.0
Trade and other receivables	5.0	38.6	106.7	211.5	300.6	183.5	695.9	455.7	453.1	760.2	422.3
Net increase in liabilities	6.7	48.7	160.8	355.1	483.8	339.9	1413.5	798.0	870.6	1579.1	1248.5
Bank and other loans	1.0	9.7	33.8	46.3	32.4	40.9	349.3	194.6	256.4	863.4	646.9
Trade and related payables	5.6	35.4	111.5	239.6	287.9	181.8	881.9	538.6	530.3	760.8	715.3
Tax and payroll payables	0.14	3.6	15.5	69.2	163.5	117.2	182.3	64.8	83.9	-45.1	-113.7
Tax arrears	0.11	2.9	12.1	60.0	128.3	113.2	157.9	98.1	95.9	-43.3	-114.4
Payroll arrears	0.03	0.7	3.45	9.2	35.2	4.0	24.4	-33.3	-12.0	-1.8	0.7
Discrepancy	4.4	27.5	34.9	163.8	-42.3	-81.8	103.0	178.3	276.0	95.9	-359.2

Note: The table of the flow of funds is modeled on Tables F.101 through F.104 of the Flow of Funds Accounts of the United States, by the Federal Reserve Board

Source: Derived and calculated from Russian State Committee on Statistics, various releases

FIGURE 9

THE ROAD TO THE GREAT DEFAULT: TAX NON-REMITTANCE, MONEY, AND GOVERNMENT BONDS, RUSSIA, 1995-98
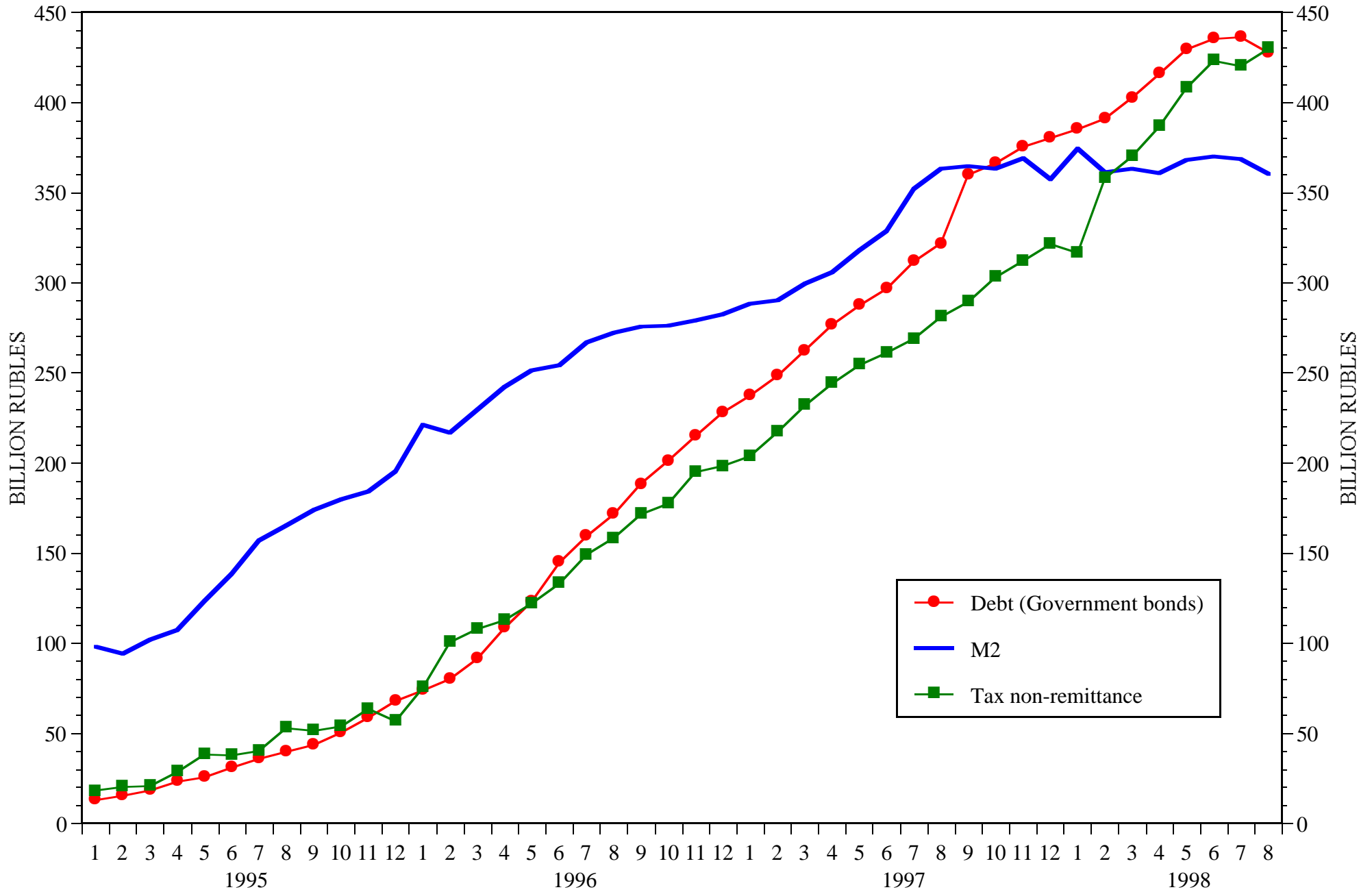
Sources:

Money and government bonds: Central Bank of Russia

Tax non-remittance: Russian State Committee on Statistics

government budget was in balance. We discussed this clause in detail in Chapter 1). This is why this system, when it is not rolled back (like in 1999-2003) is prone to serial defaults.

3. Limited by its borrowing capacity, the government has to monetize tax non-remittance. The Central Bank has to provide liquidity to enable the banking system to roll over enterprise debt and to issue new credit to make enterprises remit taxes.

4. The ready-made tax non-remittance and its forced monetization make this system self-enforceable. Tax non-remittance, monetization, and other components of the tax subsidy (payroll arrears, tax offsets, etc.) are in the state of trade-offs. Enterprises maximize overdraft invoices as the subsidy target. The government has to tolerate tax non-remittance and has to monetize tax remittance.

The trade-off between tax non-remittance and monetization which is evident in figure 7 secures self-enforcement of the tax subsidy. This is a continuous trade-off within short-term periods. At the same time, figures 7 and 8 illustrate how tax non-remittance and monetization grew in tandem over the long run constituting the combined tax subsidy extracted by the enterprise network through the buildup of arrears. This combined subsidy expansion lasted over the period 1992-98 and, on the force of the momentum, for a year-and-a-half thereafter until a policy reversal undermined this system. We witness short-term trade-offs built into a long-term joint expansion. Short-term substitution makes the system self-enforceable. Long-term complementarity of the subsidy channels reveals its self-reinforcing mechanism, a vicious cycle.

The vicious cycle of 1992-98...

A closer dissection of the tripartite relationships between arrears, tax non-remittance, and money reveals the vicious cycle in 1992-98. Figure 10 (panels 1-3) makes various bivariate scatter plots between these variables and draws a regression line through each of the bivariate relationships. The data are monthly and all samples for differently chosen periods exceed 100 observations. As an added bonus, it so happens that each panel contains a readily observable time dimension. This is because one of the two variables in each scatter is either receivables (standing for arrears) or the money stock M2 (standing for monetization as part of the tax subsidy). As one can observe in figure 7, both of these variables have been on an increasing path throughout 1992-2003, with a few seasonal monthly drops. Therefore, every scatter is automatically chronological as the dots go from the corner of zero to their final destination. One can simply view each chain of scatter points as the time dimension. For an additional visual emphasis we added an arrow between 1998 and 1999. Then the newly imposed Central Bank policy of forced repatriation and forced exchange of foreign earnings started to force remittance of taxes and thus to break the tax subsidy system. Again, the zero corner of each panel coincides with January 1992 when all the following relationships begin.

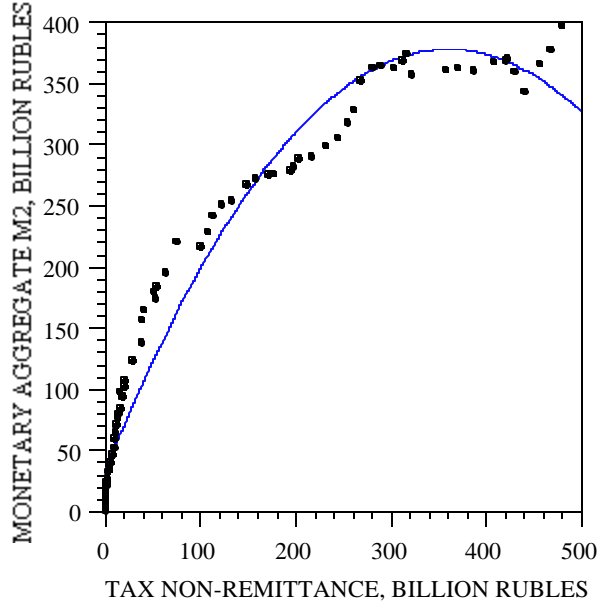First, one can test how the self-enforcement of the tax subsidy described above works in a sequence:

FIGURE 10

PANELS 1-3. TAX NON-REMITTANCE, MONEY STOCK, AND RECEIVABLES,
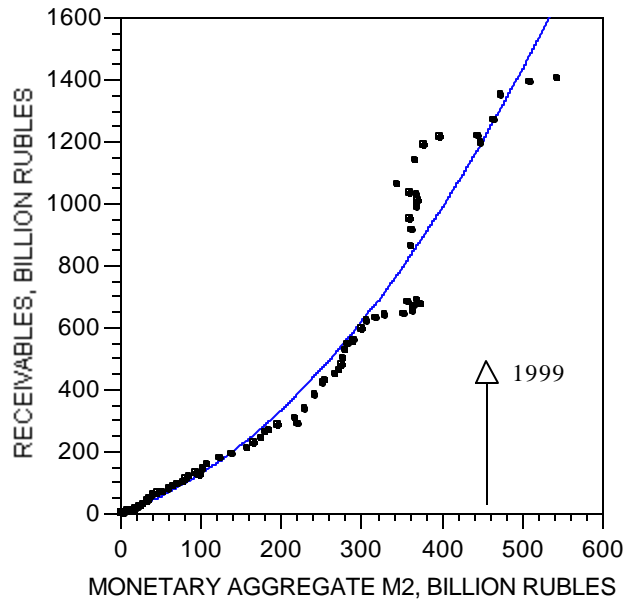IN BILLION RUBLES, MONTHLY DATA, RUSSIA, 1992-1999

Panel 1. Tax Non-Remittance against
Receivables, 1992-1999
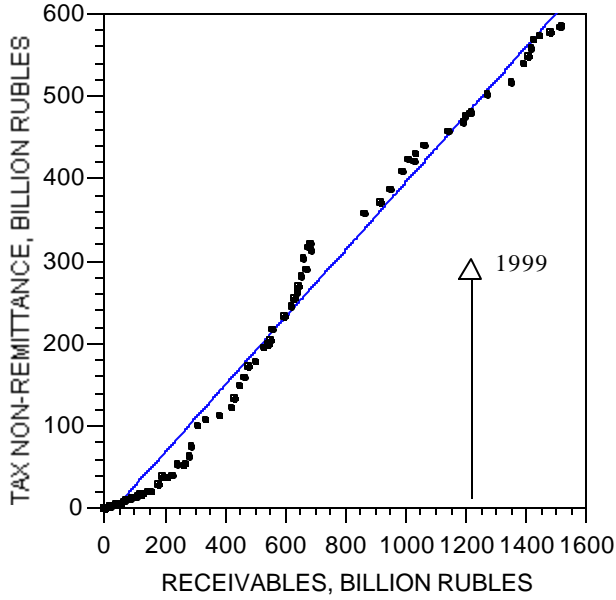
Panel 2. Money Stock against Tax Non-
Remittance, 1992-1998

Panel 3. Receivables against the Money
Stock, 1992--mid-1999

Sources:

Receivables and tax non-remittance: Russian State Committee on Statistics
Money: Central Bank of Russia

- Panel 1 relates tax non-remittance to arrears. It shows a very high positive correlation between tax non-remittance and arrears in 1992-99. A linear regression accounts for 99 percent of the variation.

- Panel 2 relates the money stock M2 to tax non-remittance. It finds a high positive correlation between these variables during 1992-98. A quadratic-form regression accounts for 96 percent of the variation. (Some deceleration is due to the short-lived tightening of monetary policy which is visible in figure 9 on the eve of the Great Default of 1998).

- Panel 3 relates arrears to the money stock. There is a very high positive correlation during the period 1992-mid-1999. A quadratic-form regression accounts for 95 percent of the variation.

We have just come full circle. The system is self-reinforcing. Overdraft invoices fall into arrears. This forces the government to license tax non-remittance. Tax non-remittance forces monetization. Monetization stimulates more overdraft invoicing. This is the vicious cycle which led to the Great Contraction of 1992-98 and the Great Default of August 1998.

...and its partial breakdown in 1999-2003

The government has rolled this system back in 1999-2003 when it forced tax remittance through forced repatriation of external earnings. These earnings are not part of the internal network of the buildup of payment arrears. Their forced repatriation, forced exchange for rubles, and application to forced remittance of taxes break down the previous relationships between overdraft invoicing, tax non-remittance, and monetization. Figure 7 shows how tax non-remittance decelerated from 1999 through mid-2001 and declined in absolute terms thereafter during forced exchange of export revenues. A continual increase of monetization in the process of forced exchange of repatriated earnings did not compensate for this decline in tax non-remittance. The total tax subsidy started to decline in the flow sense as the annual additions to the stock of the previous year. Accordingly, as table 2 calculates in column 3, annual additions to the stock of receivables in arrears, that is, net overdraft invoicing per year, started to decline rapidly. Figure 7 shows a corresponding deceleration of the buildup of the stock of arrears in 1999-2003.

Figure 11 (panels 1-3) extends the tripartite relationships between arrears, tax non-remittance, and monetization in figure 10 to the entire period of 1992-2003. It shows the transition from one fiscal regime to another during 1999-2001 as if riding over the hill. The bivariate relationships between money and tax non-remittance, arrears and tax non-remittance, and money and arrears are surprisingly highly correlated throughout the entire period 1992-2003. This indicates that the two consistent fiscal regimes, the regime of the forced tax subsidy which prevailed in 1992-98 and its rollback which took over in 1999-2003, coexist during a gradual phase-out of the former by the latter.

The second regime runs the momentum. This is why the bivariate curves are concave. The positive relationship between each pair of variables which we saw in figure 10 decelerates and eventually turns
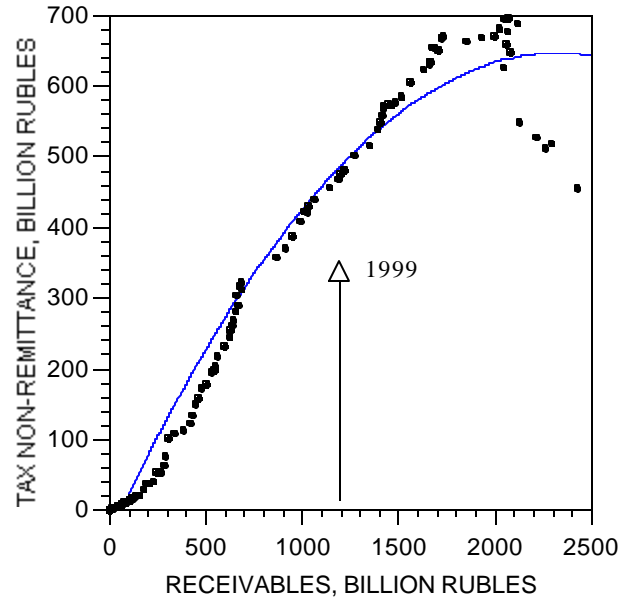
FIGURE 11

PANELS 1-3. TAX NON-REMITTANCE, MONEY STOCK, AND RECEIVABLES, IN BILLION RUBLES, MONTHLY DATA, RUSSIA, 1992-2003
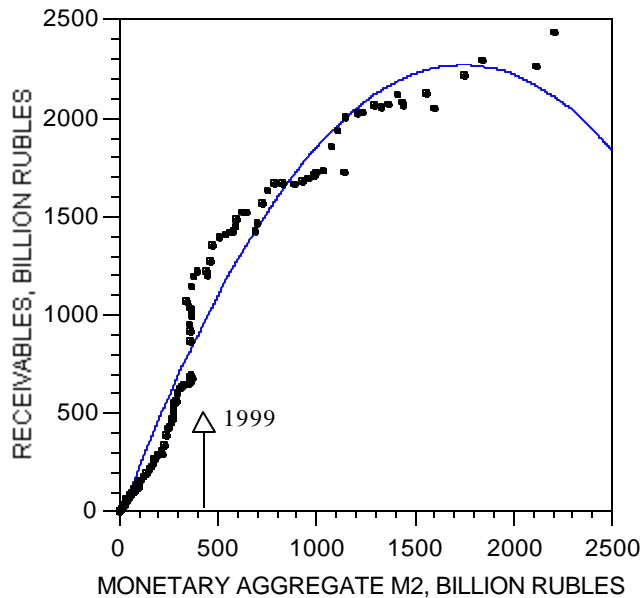
Panel 1. Tax Non-Remittance against the Money Stock, 1992-2003
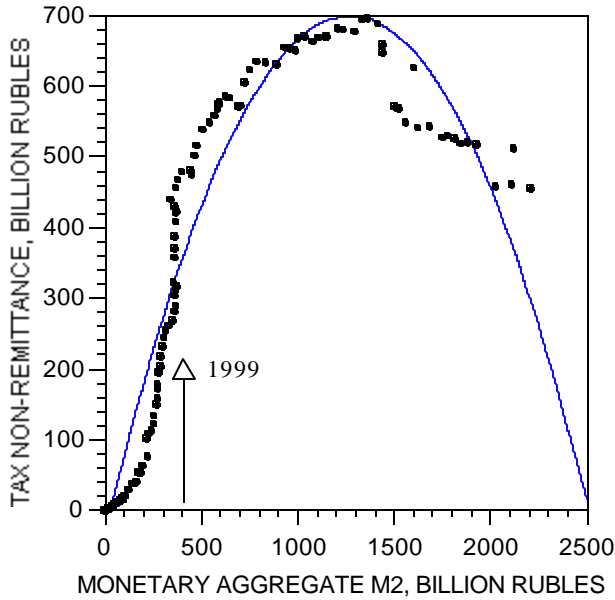
Panel 2. Tax Non-Remittance against Receivables, 1992-2003

Panel 3. Receivables against the Money Stock, 1992-2003

Sources:

    Receivables and tax non-remittance: Russian State Committee on Statistics

    Money: Central Bank of Russia

negative. The positive relationships are due to the vicious cycle pictured in figure 10 and described above. Their deceleration and negative reversal are due to the forced repatriation-cum-forced remittance policy. A simple analogy is the concave curve of the individual productivity (output per hour or per year) over one's age. Productivity (and income) is positively related to age until about age 55 on average. Productivity grows rapidly until age 40 fueled by learning and experience. Productivity decelerates thereafter, still positively related to age. The age of 55 is the top of the hill on the concave curve. Productivity (and income) gradually declines thereafter gaining the momentum. Two forces are at work against each other: learning/experience vs. aging. On the positive, upward part of the slope, the individual takes over. On the negative, downward part of the slope, nature takes over.

In the evolution of the Russian fiscal regimes, two forces are at work against each other: the enterprise network vs. the government. The network increases payment arrears, tax non-remittance, and monetization. The government decelerates all these variables. On the positive, upward part of the slope, the enterprise network takes over. On the negative, downward part of the slope, the government (specifically, the Central Bank) takes over. Except that in the individual story, the reversal of fortunes and the nature's takeover is bad news. In the Russian fiscal story of the tax subsidy, the reversal of fortunes and the government takeover is good news.

- Panel 1 of figure 11 relates tax non-remittance to the money stock M2 month-by-month during the entire period 1992-2003. They are strongly correlated. A quadratic-form regression accounts for 94 percent of the variation. It indicates that forced exchange of dollar export earning for rubles enabled forced remittance of taxes. Tax non-remittance decelerated in relation to money supply and eventually became negative. The stock of tax non-remittance declined accordingly. The same relationship is visualized in figure 7.

- Panel 2 relates tax non-remittance to arrears over the period 1992-2003. They are strongly correlated. A quadratic-form regression accounts for 97 percent of the variation. The shape of the curve indicates that (a) reduction of tax non-remittance decelerates the buildup of arrears (a positive relationship between the variables) but (b) tax non-remittance decelerates much faster and then falls while arrears slowly increase. This is the story of the virtuous cycle. Forced remittance induces enterprises to pay off trade arrears. Enterprise do that because lower cash balances in the bank reduce government pressure to remit taxes. This creates a feedback. A lower stock of payment arrears eases the payment jam and weakens the power of enterprises to enforce tax non-remittance. In turn, a lower tax subsidy due to higher remittance reduces enterprise incentives to overdraft invoices. Tax non-remittance falls even further. Reiterative feedbacks induce more tax remittance and even dissipate the backlog of past non-remittance. The stock of tax non-remittance declines. The momentum of this virtuous cycle is visible in the right segment of figure 7 and of panel 2 of figure 11.

- Panel 3 relates arrears to the money stock during the entire period 1992-2003. Their correlation is very strong. A quadratic-form regression accounts for 97 percent of the variation. Arrears

increase in relation to monetization but this effect gradually decelerates after 1999 and the negative momentum for their relationship grows. Forced exchange of export dollars for rubles (working through forced remittance, as we observed in the previous bivariate relations) slows down the buildup of arrears. This makes arrears grow slower than the money stock.

But we saw all this before. This was the dramatic roller coaster of the green curve in figures 1-3. We have come full cycle indeed. These tripartite relationships between arrears, tax non-remittance, and monetization on the upward and downward slopes influenced the blue curve of the GDP path in figures 1-3. They are behind the roller coaster of the Russian economy in 1992-2003, with its Great Contraction and a partial recovery.

The roller coaster of the tax subsidy

The tax subsidy can be approximated on the accrual basis as the share of net receivables per year in GDP. The accrual basis implies that the tax subsidy commensurate to annual net receivables does not have to be secured during a given year. It only has to be secured eventually, which always happens as figures 7 and 8 show. Column 5 of table 2 imputes the tax subsidy on the accrual basis as a share of GDP. In 1991, a central plan version of government financing of enterprise arrears amounted to 4.6 percent of GDP. After liberalization and privatization, the tax subsidy emerged. It jumped to 21.8 percent of GDP in 1992. It then gradually declined but continued to be high, at 18.5 percent of GDP in 1993, 14.2 percent in 1994, 11.6 percent in 1995, and 13.1 percent in 1996. It fell to 5.3 percent of GDP in 1997, only to jump again to 19.8 percent of GDP in 1998. On average, the tax subsidy amounted to 15 percent of GDP during 1992-1998.

A policy reversal of late 1998 brought the tax subsidy down to 5.5 percent of GDP in 1999, to 3.5 percent in 2000, to 3.6 percent in 2001, and to a low 2.0 percent of GDP in 2002. On average, the tax subsidy declined to 3.7 percent of GDP during 1999-2002. Compare 15 percent of GDP in the tax subsidy in 1992-98 with 3.7 percent in 1999-2002. This is a dramatic shift of fiscal regimes. Overdraft invoicing for the buildup of arrears declined precisely as dramatically in 1999-2002. This deceleration, in turn, led to economic recovery in 1999-2003.