Grossman - Horváth, and Hyperinflation in Hungary, 1944-1946

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The recent contribution in this Journal by P. Z. Grossman and J. Horváth on the Hungary II hyperinflation of 1945-46 is welcome, both because of Professor Horváth's personal role in Hungarian government at the time it occurred, and because it opens discussion on aspects of this inflation which need re-addressing. According to Grossman and Horváth, inflation was a means consciously chosen by the post-war administrators to accelerate economic recovery under difficult circumstances, and government was largely successful in this commendable aim.[1] But their study is notably light on tangible evidence, and invites the reader to take a great deal on trust. This reply questions whether (hyper)inflation was at any time an effective instrument of recovery policy, and asks whether it was merely a crude device to facilitate the transfer of reparations to the Soviet union.

As well as this central issue, several other statements by Grossman and Horváth need re-examination, including dating the onset of hyperinflation, the alleged absence of economic recovery before inflation policies were applied, the developmental impact of the tax-pengő policy between January and May 1946, and the characteristics of hyperinflation in June-July 1946 when the tax-pengő was monetised.

Grossman and Horváth treat the hyperinflation as beginning in the late summer of 1945. They use Phillip Cagan's definition by which hyperinflation starts when prices first rise at 50 percent per month or more, and continues for as long as inflation fails to stay below this level for at

[1] Peter Z Grossman and János Horváth, 'The dynamics of the Hungarian hyperinflation, 1945-6: a new perspective', *Journal of European Economic History*, 29 (2000), pp. 405-427.

least a year. I accept this definition,[2] but on this basis, the hyperinflation started in the winter of 1944/45. In March 1945, the first price index figure appears after the Battle of Budapest, "the food requirements of an average Hungarian family". It indicates that the cost of essentials was then 175.2 times the September 1939 level.[3] Therefore food prices rose between November 1944 and March 1945 to 54 times their former level, implying a hyperinflationary 171 percent monthly rate of rise over four months. However, the price explosion was probably of shorter duration, concentrated within the peak period of battle, December 1944 to January 1945, after which the new, hugely inflated, level of prices stabilized or fell. The evidence for this is that the black market dollar rate for the pengő, 5.4 in 1938, rose to 44.2 in 1944, and to 250 by the end of January 1945. But after this it ceased to rise. It was quoted at 175 in late March, and at 200-230 on 13 April.[4] Secondly, the "food requirements" price index fell by 34 percent between March and April 1945. We conclude that the burst of hyperinflation was to a significant extent caused by supply-side shock - the devastation wrought by the battle - and was also the product of the forced abandonment of rationing in a very inflationary economy, which had kept the official prices of essentials far below their equilibrium rate.

The brief price explosion in the winter of 1944/45 seems not to have been propelled by significant monetary emissions. The Liberation government lost its printing presses, and could issue no new notes till 9 May 1945. Consequently the circulation of notes issued by the Hungarian central bank amounted at the end of April to 11.7 billion pengős, a figure that had not grown significantly since November 1944.[5] Therefore "in

[2] P Cagan, 'The monetary dynamics of hyperinflation', in *Studies in the Quantity Theory of Money*, ed. Milton Friedman (Chicago 1956), pp. 25-117. My reasons for accepting this working definition are explained in Michael Palairet, *The Four Ends of the Greek Hyperinflation of 1941-1946*, (Copenhagen 2000), pp. 10-17.

[3] Public Record Office, London. [PRO] FO 371-48502. Hungary (2) British Military Mission in Hungary. Memorandum. Inflation in Hungary, 26 Nov. 1945.

[4] Pierre L Siklos, *War Finance, Reconstruction, Hyperinflation and Stabilization in Hungary, 1938-1948*, (Oxford 1991), p. 185; PRO FO 371 48500, BMM, 27 Mar. 1945; British Representative, ACC – Chairman ACC, 16 Apr.1945.

[5] *Reports submitted to the 21st Ordinary General Meeting of the General Assembly of the National Bank of Hungary held on March 27, 1947.* (Budapest, National Bank of Hungary, 1947), supplement 4.

early 1945", Grossman and Horváth represent the nominal stock of money to have been "nearly constant".[6] They concede that the Red Army High Command issued its own pengő currency notes but dismiss these emissions as of negligible consequence.[7] They claim that the "nearly constant" stock of money resulted in price stability, allegedly because output stagnated, so (at an unstated date), the government began creating fresh money in order to get output to grow.[8] However, contrary to Grossman and Horváth's contention, money-supply changes were quite large enough to have a significant impact on the price level between the beginning of February 1945 and the resumption of government note printing. The nominal stock of money was not "nearly constant".[9] The Red Army had issued over 4 billion pengős by the end of April,[10] possibly 5 billion by mid May[11]. They entered into circulation mainly between January and mid-May, because when the new government issues came on stream, the Soviets reportedly ceased issuing Red Army pengős, and drew on government notes[12]. Therefore by 8 May, taking these estimates, Red Army notes would have expanded the circulation by about 42 percent.[13] Additionally significant quantities of roubles were circulated in eastern Hungary by the Soviet forces during the early stages of the occupation, and were declared legal tender at 2.5 pengős per rouble[14]. Trade must have been recovering rapidly in the spring of 1945 (though

[6] Grossman and Horváth, 'Hungarian hyperinflation', p. 409.

[7] To support this statement, Grossman and Horváth cite Siklos on the Red Army pengő issues. Siklos's data and discussion do not provide unequivocal support. See Siklos, *War finance*, pp. 85-86, 98.

[8] Grossman and Horváth, 'Hungarian Hyperinflation', p. 409.

[9] *Ibid.*

[10] Louis Mark Jr., 'The View from Hungary', in *Witnesses to the Origins of the Cold War*, ed. Thomas J Hammond, (Seattle 1982), p. 200, gives 'over 4 billion', and 40% of circulation by the end of April. Siklos, *War finance*, p. 86, using Mark's thesis, gives 43 billion, which I presume to be an order-of-ten error.

[11] PRO FO 371 48500, BMM memorandum no. 4, 14 May 1945.

[12] Bank of England [BoE] OV 33/56, report by J D Stewart, 28 May 1945; Richard Banyai, *The Legal and Monetary Aspects of the Hungarian Hyperinflation, 1945-1946*, (Phoenix, Arizona 1971), p. 1.

[13] Mark, 'View from Hungary', p. 200.

[14] PRO FO 371 48500, memorandum, finance and property section, 14 Apr. 1945; FO 371 58971, Helm, 26 Jul. 1946. The Hungarian government was required to redeem this note issue.

from a very low level) to sustain a falling price level in the face of the swollen money supply caused by Red Army pengő and rouble emissions.

Once the government could print its own money again, it did so with a vengeance. The "food requirements index" surged by a ferocious 38% in May, 17 percent in June, 18 percent in July, and 50 percent in August. Grossman and Horváth stress that the authorities were using inflation as a tool of economic recovery, a device for extracting big quantities of seigniorage which they passed on to industries, public and private, for reinvestment.

To assess the impact of this inflationary recovery policy issue, we need a quantitative review of the spending aggregates and the revenue resources sustaining them. The only monthly data I can find on the volume of reparations finance is a tabulation for July 1945-May 1946 by Bomberger and Makinen, together with fiscal revenue and non-reparations items of Hungarian government spending. They used a contemporary official United States source[15].

The Bomberger-Makinen figures are quoted in current pengős, so they need an appropriate deflator for the monthly average value of the emissions that financed them. This is complicated by the enormous changes in prices across monthly periods. For prices between 15 August 1945 and May 1946 I have used the official index for the valorization of loans based on the rent-excluded cost of living. This sets 15 August 1945 at 100. This index was then linked to the "food requirements index" from March 1945 (whose September 1939 price level was set at unity). Note circulation figures at various dates (usually twice a month) were taken from the central (National) Bank report for 1947. Where these did not overlap with price figures, the volume of issues was geometrically interpolated, permitting calculation of mean daily emissions at a series of short periods, deflated by prices. From these, monthly average real values of emissions could be estimated, and correspondingly, the mean price at which each month's emissions were emitted.

[15] W A Bomberger and G E Makinen, 'The Hungarian Hyperinflation and Stabilization of 1945-1946', *Journal of Political Economy*, 91 (1983) p. 805. They cite L. Laszlo Ecker-Racz, *Hungarian Economic Developments January 1945 – June 1946*, (Budapest, US Legation 1946), pp. 58, 60.

The relevant figures are displayed in Table 1.

TABLE 1. Hungary. State spending, reparations* and revenue, July 1945-May 1946

		current pengös					
		state spending				Revenue	
	deflator	civil government	state industrial deficits	reparations, etc.*	total	fiscal taxation	seigniorage
Jul-45			8.96E+08	7.81E+08	3.40E+09	2.31E+08	
Aug-45			1.71E+09	3.06E+09	9.01E+09	7.46E+08	
Sep-45			3.70E+09	3.95E+09	1.66E+10	1.21E+09	
Oct-45			1.38E+10	1.37E+10	5.66E+10	3.22E+09	
Nov-45			5.48E+10	8.47E+10	2.72E+11	1.80E+10	
Dec-45			1.08E+11	2.96E+11	7.45E+11	5.30E+10	
Jan-46			1.94E+11	3.18E+11	1.19E+12	1.69E+11	
Feb-46			7.20E+11	1.50E+12	4.70E+12	6.80E+11	
Mar-46			3.50E+12	1.30E+13	3.35E+13	4.35E+12	
Apr-46			3.64E+13	2.22E+14	4.48E+14	4.38E+13	
May-46			7.50E+15	2.45E+16	6.39E+16	4.70E+15	
		thousands of pengös of 1939 value:-					
Jul-45	2.41E+02	7170	3722	3244	14136	960	13177
Aug-45	3.45E+02	12267	4967	8878	26122	2163	23949
Sep-45	6.49E+02	13712	5703	6088	26353	1864	23639
Oct-45	3.59E+03	8124	3836	3820	15779	898	14880
Nov-45	1.79E+04	7395	3058	4728	15687	1004	14178
Dec-45	6.09E+04	5594	1778	4868	12240	872	11368
Jan-46	8.26E+04	8223	2349	3851	10327	2047	12377
Feb-46	4.04E+05	6133	1781	3709	12706	1682	9941
Mar-46	1.80E+06	9448	1945	7225	18618	2418	16201
Apr-46	2.28E+07	8300	1593	9718	20265	1917	17694
May-46	3.47E+09	9206	2164	7071	18441	1356	17085
Monthly average		8688	2991	5746	17333	1562	15863
1945/6 annual rate§		104260	35887	68946	209093	18741	190352
% of state spending		49.9%	17.2%	33.0%			
% of National Income		4.1%	1.4%	2.7%	8.2%	0.7%	7.4%

* Reparations, etc. include costs of Soviet occupation and the Allied Control Commission.
§ Twelve times monthly average.
For calculation of the price deflator from consumers' prices and the monthly mean value of central bank note emissions, see text, above.

Source for current price revenue, spending and reparations: W A Bomberger and G E Makinen, 'The Hungarian Hyperinflation and Stabilization of 1945-1946', Journal of Political Economy, 91 (1983) p. 805.
Source for the price index is Magyar statistikai évkonyv, 1943-46 (Budapest, 1948), p. 173, table 5. Note circulation figures come from Reports submitted to the 21st Ordinary General Meeting of the General Assembly of the National Bank of Hungary held on March 27, 1947. (Budapest, National Bank of Hungary, 1947) supplement 4. Hungary's national income is estimated for 1945/46 fiscal year at 2,559 million pengös of 1938/39 value, the mean of the estimated range given in Pierre L Siklos, War Finance, Reconstruction, Hyperinflation and Stabilization in Hungary, 1938-1948. (Oxford, 1991), p. 162.

It is clear from Table 1 that the authorities made little attempt to revitalize the collapsed tax administration. Throughout the period of Table 1, fiscal taxation yielded the derisory return of 0.7 percent of (estimated) national income. Seigniorage provided 91.1 percent of all government finance for current spending, industrial subsidies and reparations. Though government was trying to maximise its revenue from printing money, this raised it a meagre 7.4 percent of 1945/6 national income, so combined with fiscal taxation, the state disposed of but 8.1 percent of national income. Conditions under which the issue of new money could have aided an inflationary recovery, however weakly, were probably confined to the summer and early autumn of 1945. Of course, it was tempting at that time to augment the trivial sums raised from taxation by driving the new money printing press, so, during August and September 1945, a relatively rich harvest of seigniorage was extracted – about 25 million pengős a month of 1939 value. However, the pursuit of seigniorage was pressed too far and too fast. In so doing, government progressively destroyed much of its non-fiscal revenue, because the public, in the classic response to anticipated extreme inflation, reduced its demand for fiat money vigorously in order to reduce its exposure to expected future inflation tax.[16] Between 1 and 31 October, the "food requirements" price index leaped by 731 percent. Despite the speed-up of emissions, the value of seigniorage extracted fell in October from its peak level of August, to 18.1 million pengős of 1939 value. It fell again in November to 14 million. This squeezed total spending accordingly. So at least by November 1945, inflation policy was retarding reconstruction. Given the spending exigencies of a country emerging from defeat and destruction, inflation was a hopelessly inadequate substitute for taxation, because of its low, limited and diminishing revenue yield.

In terms of reconstruction policy, Grossman and Horváth do, of course, stress the credit policy pursued by the National Bank, rather than state budget policy as such. However, most of the credits emitted were

[16] This process, when the state is wrong-footed by public reaction to extreme inflation, and loses seigniorage by driving the presses too fast, rather than gaining more, is explained in Rodney Jacobs, 'Hyperinflation and the supply of money', in Forrest Capie (ed.), *Major Inflations in History*, (Aldershot 1991).

in the form of treasury bills. These bills represented payment for goods and services provided to government (including reparations production). These were quickly rediscounted at the central bank, in whose portfolio the vast bulk of them must have been held. The issue of treasury bills constituted government spending, which has already been picked up. Commercial bills would, however, provide additional economic stimulus. Some latitude appears to have been allowed for the banks to issue commercial bills up to November 1945. To the end of September, 1.1 billion pengős of commercial bills had been granted and subsequently rediscounted.[17] If valued at mid-August prices, they would amount to 3.2 million pengős of 1939, spread out over several months, which is insignificant. In November such bills were made ineligible for rediscount at the central bank.[18] Therefore business could borrow little from the banks on commercial paper, because the small (and transient) real volume of deposits restricted their credit capacity. At the end of 1945, 97.2 percent of the central Bank's [re]discount portfolio comprised treasury bills, commercial paper, 2.8 percent.[19] So virtually the entire inflationary stimulus given by credit policy in 1945 is already picked up in Table 1. (The credit effect of the re-growth of private deposits under the tax-pengő system in the spring of 1946 is dealt with below)

Revenue, however obtained, was needed not only for government domestic spending and occupation costs, but also to finance reparations deliveries to the Soviet Union. Under the terms of the 15 June 1945 reparations agreement, Hungary had to pay the Soviets $200 million in reparations, as calculated at pre-war international market prices, while a further $100 million was due to Czechoslovakia and Yugoslavia[20]. The sum of $300 million excluded occupation costs. Moreover, imports to

[17] I. T. Berend and Gy. Ránki, *The Hungarian Economy in the Twentieth Century*, (Beckenham 1985), p. 188.

[18] BoE, OV 33/24, Aide Memoire concerning the general position of banking in Hungary, 14 Nov. 1945, fo. 13B.

[19] *Reports ... of the National Bank of Hungary ... 1947*. p. XII.

[20] PRO FO 371 58971, Draft article for publication in Board of Trade Journal, 3 Sept. 1946, fo. 2; also see W Brus, 'Postwar reconstruction and socio-economic transformation', in M. C. Kaser and E. A. Radice, (eds.) *The Economic History of Eastern Europe, 1919-1975*, Vol II, (Oxford 1986), p. 572.

the Soviet Union of dismantled Hungarian equipment, including 700 carloads of equipment from a big electrical factory, were treated by the Soviets not as reparations deliveries but as "war booty".[21] The American authorities reckoned the Soviets confiscated $124 million of industrial equipment[22] but Siklos shows only $10 million to have been credited to reparations from dismantled plant[23]. The Americans were in no doubt that the reparations delivered were grossly undervalued, even at the pre-war 5.4 pengős to the $ exchange rate.

Even so, reparations were to be spread over six years,[24] and as a proportion of Hungary's output, the Soviet reparations schedule does not look particularly onerous, especially as only $33.5 million was sought for 1945[25]. But without a taxation system, the volume of reparations which Hungary could finance was controlled by the meagre extent to which seigniorage could be extracted by abusing the currency to pay for the production of reparations goods.

The Table 1 statistics show that reparations payments (including occupation costs) amounted to 69 million constant pengős in 1945/46, a modest 2.7 percent of national income, but they absorbed 33 percent of total government revenue (including seigniorage). In fact the cost of reparations probably exceeded this, because another substantial spending item, state enterprise deficits, accounted for 17.2 percent of total state spending. As there were frequent comments to the effect that reparations deliveries were supplied to the Soviets at well below production cost,[26] these deficits probably resulted partly from financing reparations production. The size of this concealed reparations bill cannot, however, be determined from the available statistics, but when all the external transfers of government income are taken into account, that is to say occupation costs, reparations and concealed reparations, government was left with between 4.1 percent and 5.4 percent of national income to

[21] Mark, 'View from Hungary', p. 204 n. 20.
[22] PRO FO 371 58971, no. 578, extract from Soviet press, 1 Aug. 1946, fo. 16.
[23] Siklos, *War finance*, p. 94.
[24] Mark, 'View from Hungary', p. 198; BoE, OV 33/24, 22 Jun 46, fo. 7.
[25] PRO FO 371 58971, no. 578, extract from Soviet press, 1 Aug. 1946 fo. 15.
[26] FO 371 48502, BMM Memorandum, 26 Nov. 1945, fo. 19; BoE, 33/24, OV Stewart – Culpin, 9 Mar. 1946, fo. 111a; OV 33/24, BMM, memorandum no. 9, 22 Jun. 1946, fo. 7.

spend. This sum could only have left a very small residue to pay for reconstruction, after meeting current spending commitments.

In 1945, the Soviets did not extract reparations at anything like the rate they intended. They were later to claim they obtained less than $2 million in reparations up to 20th January 1946, out of $33 million to which they were entitled by this date[27]. Moreover, the Table 1 statistics indicate a sharp decline in the finance for reparations production caused by the diminishing yield of seigniorage in late autumn and winter of 1945. By January 1946, the real value of reparations and occupation payments had steadily fallen from August's peak level of about 8.9 million 1939 pengős to 2.76 million. In 1945, the Soviets had knowingly allowed reparations payments to fall into arrears,[28] possibly because they did not wish to alienate the Hungarian electorate from support of the Communists. However, at the elections held on 4 November 1945, the electorate massively opted for the Smallholder party, and rejected the Communists, though the latter nevertheless had to be granted the key security ministries. Indifferent now to public opinion constraints on reparations, the Soviets and their Hungarian Communist allies pressed the reparations demands with renewed vigour. So the new government faced an irresoluble financial crisis, caught between shrinking revenues and mounting Soviet reparations pressures. Pressing emissions still harder would only diminish the ex-post seigniorage yield still further, by intensifying the flight from fiat money.

As a result the authorities resorted to theft. On 17 December, the government required that all notes of significant value be surrendered for over-stamping, at the cost to the holder of three times their face value. (i.e. three quarters of the nominal value of these notes was confiscated overnight). The resulting unanticipated shrinkage of the nominal money supply by about 60 percent[29] led in the short run to a 42% fall in prices between the 19th and 27th December. The purpose was to net the government a windfall for re-issue of about 4 billion pengős of 1939 value (at least if it could spend

[27] PRO FO 371 59000, Brit. Political Mission in Budapest, 15 Apr 1946.
[28] BoE, OV 33/24. Extract from economic aide-memoire of Hungarian government, 2 Oct. 1946 – (2) Hungary's international obligations.
[29] Siklos, *War Finance,* pp. 100-101; F.F. Winklé, 'Some aspects of the recent inflation and stabilization of the Hungarian currency', *South African Journal of Economics,* 15 (1947) p. 179.

them at once). But even including this windfall, December's harvest of seigniorage fell against that raised in November to 11 billion 1939 pengős, and prices resumed their vertiginous ascent at the end of the year.

One reason for the slowdown in reparations deliveries in the late autumn and winter of 1945 had been an increasing shortage of raw materials. Payment was putting excessive strain on the Hungarian economy[30]. The Soviets realised that this was the case because on 21 December they contracted to supply Hungary with $30 million of materials for processing on reparations account. This concession would make possible larger future deliveries, and consequently would sustain a higher level of industrial production[31]. Despite this concession, the Soviets were highly dissatisfied. They released the $2 million figure for reparations as an expression of this dissatisfaction and were determined to collect the "delinquency" plus a further $37 million by the end of 1946.[32] In the winter of 1945/6, Soviet economic interest in Hungarian affairs was therefore to focus on the collection of reparations, and on securing forced economic concessions. Correspondingly, reparations became top priority for the Hungarian Communists, who were, according to British reporting, highly "enthusiastic about handing over a mammoth chunk of Hungary's economic heritage to Russia."[33] In the light of the disastrous conditions obtained in the winter of 1945/6, the Americans became concerned about Soviet economic pressure on Hungary, but the Soviets treated the subject as ineligible for discussion, even with their allies – much less with the Hungarians.[34] When the chairman of the central bank sent a memorandum to the western allies, calculating that the reparations burden would be almost three times the agreed amount, he was summarily relieved of all his posts by Marshal Voroshilov.[35]

It seems probable that the confiscation of December 1945 was also instigated by the Soviet military authorities under Voroshilov, or was at

[30] Mark, 'View from Hungary', p. 198.
[31] Siklos, *War Finance*, p. 95; PRO FO 371 58970, BMM memorandum 8 of 25 Mar. 1946, fo. 1.
[32] PRO FO 59000 Brit. Political mission in Hungary, 15 Apr 1946; BoE OV33/24, Stewart-Culpin, 9 Mar. 1946.
[33] BoE, OV33/24, Stewart-Culpin, 9 Mar. 1946.
[34] Mark, 'View from Hungary', pp. 146-7.
[35] *Ibid.*, p. 198.

least prompted by Soviet pressures. Voroshilov had hoped that the December confiscation would hold prices stable, facilitating the extraction of larger reparations, but had evidently not expected the Hungarian government to continue pressing up the volume of circulation, and therefore the level of prices. This implies that the Soviets reckoned the Hungarian government had been trying to spend its confiscation windfall other than for boosting reparations output. If so, he was wrong, because as total government spending shrank, the reparations share was rising. The underlying problem was the weak and diminishing ability of the state to extract seigniorage from the issue of its currency.

On 19 January 1946, Voroshilov therefore sent one of his officers, Major Katov, to the Hungarian National Bank, to "investigate". Katov's authority extended to controlling all financial activities of the bank, especially its disbursements. On Voroshilov's orders he suspended the printing of 100,000 pengő notes (the highest denomination then in issue). This initiative Voroshilov described to his Allied Control Commission partners as an "experiment" of his own making. Katov also ordered an end to emissions of money for the account of the government.

This act of economic illiteracy caused panic in government circles, and the fear that the economy would collapse. It turned out, however, to be a device for undermining the influence the non-Communist Smallholder Party exerted over financial affairs through its control of the finance ministry and the central bank. After protracted discussions, Katov permitted the resumption of official monetary emissions, on condition that they were approved by Zoltán Vas, a leading Muscovite Communist and Secretary General of the newly formed and Communist-controlled Supreme Economic Council (SEC). A compromise was reached under which central bank loans to government would be cut from 45 billion (current) pengős a day to 20 billion. The SEC would control allocation of this credit. New rules were imposed to divert credits from producers of "inessential goods" to "the more important branches of industry".[36]

[36] Voroshilov's intervention and Katov's mission are discussed in BoE, OV 33/56, Gascoigne, no 46 of 22 Jan. 1946, fo. 157A; Gascoigne, no. 54 of 24 Jan. 1946, fo. 157B, Gascoigne, no. 57 of 25 Jan. 1946, fo. 157C; Gascoigne – FO, 31 Jan.1946, fo. 161B.

The clear intention was to squeeze the already exiguous spending on collective consumption and on the provision of supplies to consumers and to divert the resources to expand the output of reparations goods.

Once they had tightened their grip on finance, the Soviets proceeded to drive their own extraction of resources month by month back up to 10 million pengős of pre-war value in April 1946 or nearly 50% of government spending. Despite this the Soviets remained dissatisfied, and "turn[ed] on the heat", alleging sabotage[37]. In June 1946, Soviet controlled commissioners were placed in all factories working on reparations orders.[38] In July, half of all manufacturing output was reportedly absorbed by reparations and other Soviet requirements.[39] The most effective way to garner the resources would have been by raising fiscal taxation. Strangely however, Louis Mark observes that the inflation policy was "directly related to Soviet objectives", and that the finance minister, Istvan Vásáry, resigned in protest. Vásáry would presumably have wanted to try to balance the budget, and end the inflation. Soviet objectives, which clashed with the maximization of reparations deliveries, apparently included the destruction of the market economy, and the "middle and upper classes"[40]. If so, in 1946 at least, inflation became little more than a crude device for facilitating the extraction of reparations by the Soviets from the Hungarian economy. It ceased to provide a source of reconstruction funds, because the rise in reparations funding crowded out such resources as were available to the state for reconstruction. The government struggled to prevent its own spending from being crowded out by Soviet demands, and actually increased it in real terms, so the intensity of inflationary pressure mounted again at a rate which became unsustainable.

A further device for channelling funds into industry was the tax-pengő

[37] BoE, OV 33/24 Stewart-Culpin, 9 Mar. 1946, fo. 111a.
[38] BoE, OV 33/24, BMM memorandum no. 9, Finance and Property Section, 22 Jun. 1946, p. 7.
[39] PRO FO 371 58971, Text of U.S. note to the Soviets on Hungary, cutting from New York Times, 27 Jul. 1946.
[40] Mark, 'View from Hungary', p. 201.

scheme, introduced in January 1946. This provided for the indexing of Budapest bank and savings bank deposits. The intention was to revive private savings by sheltering them from inflation, and to provide a lawful alternative to hoarding dollars.[41] The funds deposited were lent to finance industrial production. A further motive, as the name of the tax-pengő implies, was to force the indexation of tax payments, and increase revenue – though as Table 1 shows, this gave limited and transient results. So far from acting as a stabilizing measure, Bomberger and Makinen argue that the provision of this indexed shelter reduced the transactions demand for pengő currency, reducing the tax base for inflation tax, and consequently accelerated the inflation to unprecedented speed.[42]

Table 2 estimates the resources generated by the rebuilding of private savings deposits through the tax-pengő system between January and May 1946.

TABLE 2. The accumulation of tax-pengő deposits, January – May 1946

	Tax-pengő deposits, regular pengő equivalent	prices	Tax-pengő deposits In 1939 pengős	Accumulation of tax-pengő deposits
31-Jan-46	2.96E+10	1.49E+05	199309	199309
28-Feb-46	5.62E+11	9.39E+05	598649	399340
31-Mar-46	8.67E+12	4.10E+06	2113774	1515125
30-Apr-46	1.94E+14	6.80E+07	2850084	736310
31-May-46	7.05E+16	2.23E+10	3166094	316010

Source: Tax- pengő deposits in their official equivalent as regular pengős are given in R. B. Anderson, W. A. Bomberger, and G. E. Makinen, 'The demand for money, the "Reform Effect", and the money supply process in hyperinflations', *Journal of Money Credit and Banking*, 20 (1988) pp. 669-70. Prices (in regular pengős) are as in Table 1.

As Table 2 shows, except in March of 1946, the sums raised through savings in tax-pengős and made available for investment by business and government were trivial. Over the whole period, they totalled 3.17

[41] B. Nogaro, 'Hungary's recent monetary crisis and its theoretical meaning', *American Economic Review*, 38 (1948) p. 530.

[42] W. A. Bomberger and G. E. Makinen, 'Indexation, inflationary finance, and hyperinflation: the 1945-1946 Hungarian experience', *Journal of Political Economy*, 88 (1980) pp. 550-60.

million pengős of 1939 value, that is to say their monthly accumulation amounted on average to 0.30 percent of Hungary's monthly national income. So even if we ascribe this new flow of private savings to the government's inflation policy, it still yielded paltry potential reconstruction funds. Maybe more could have been raised, but the accumulation of tax-pengő claims diminished sharply after March. This may well have been because in April, the authorities started deliberately to under-index the value of the tax-pengő, so that it ceased to offer a store of stable value.[45] Anyway, we should not treat these savings as an addition to reconstruction funding, because savings under a (relatively) stable monetary regime would probably have been much larger. All that the tax-pengő system achieved was the retrieval of a small part of the private investment finance that the hyperinflation had choked off.

It is doubtful whether much of this modest supplemental funding was applied to the purpose of reconstruction. On the other side of the balance, the industrial borrowers of tax-pengős were supposed similarly to repay their credits on an indexed basis, and not as hitherto, to "profit from depreciation".[46] True, indexation lagged the price level, but even so, probably because of controls on output prices, the borrowers were losing money copiously and were unable to service their debts.[47] By June, "most larger firms [were] working on reparations account or on government account, receiving raw materials and delivering finished goods without payment, and financing themselves from day to day by cash drawings from the appropriate ministries or the SEC."[48] So the tax-pengő scheme became another mechanism for covering deficits, rather than a source of accumulation.

Grossman and Horváth show a graph of manufacturing output from January to August of 1946, which appears to have risen by about 36 percent over this period. They use it to show the progress made in "the state of the Hungarian economy" as a result of the hyperinflationary revitalisation policy.[49] It should however be borne in mind that manufacturing industry

[45] Nogaro, 'Hungary's recent monetary crisis', p. 540.
[46] Stephen Varga, 'Hungary's monetary crisis: a comment', *American Economic Review*, 29 (1949) p. 956.
[47] Varga, 'Hungary's monetary crisis', p. 957.
[48] BoE, OV 33/24, British Military Mission memorandum no. 9 of 22 Jun. 1946, fo. 3.
[49] Grossman and Horváth, 'Hungarian hyperinflation', pp. 425-6.

was still working hugely below capacity. According to Berend and Ránki, industrial production in 1945 ran at 20-25 percent of the 1935-38 average, and in 1946 at 36 percent. However, a surge of industrial investment beginning in 1938 had pushed industrial output within Hungary's 1938 territory up by 37.5 percent in 1943,[48] so 1945 output was only about 16 percent of this peak level. War-related losses in manufacturing industry (it is not clear if these included Soviet dismantlings) accounted for 23.9 percent of capacity, so post-war industrial capacity should have been 5 percent above pre-war, (as Berend and Ránki do in fact observe).[49] So if 1946 output ran at 36 percent of pre-war, most factories were working at about a third of their surviving capacity. As the main limiting factor was material and fuel inputs, the modest re-growth of industrial production in 1945/6 from an extremely low initial level probably has to be ascribed to forced production for reparations with Soviet materials. The reconstruction of transport infrastructure must have made some contribution, but according to Siklos's statistical table, the railways were still hardly functioning at all at the end of 1946. From this table, the key to easing supply conditions seems to have been the import of large numbers of commercial road vehicles, supplied mainly by the USA.[50] Reinvestment had to wait. Any positive results of Grossman and Horváth's claimed inflationary recovery policy dwindle to insignificance.

In summary, Grossman and Horváth invite us to acknowledge the achievement of the Hungarian governments during the inflation period of using inflation as a means, "indeed the principal means" of restoring the Hungarian economy. They provide no statistical evidence that their policies stimulated the economy in May-November 1945, when inflation policies could be implemented for this objective. Even during this period, when the harvest of seigniorage was relatively high, government disposed scanty resources from it to allocate for reconstruction, and by November it had largely destroyed this source of revenue by trying to extract too

[48] I T Berend and Gy. Ránki, *Hungary. A Century of Economic Development.* (Newton Abbot, 1974) pp. 194, 176.

[49] Berend and Ránki, *Hungarian Economy,* pp. 174-5. and Berend and Ránki, *The Development of the Manufacturing Industry in Hungary, 1900-1944.* (Budapest, 1960) p. 162.

much of it. The only quantitative evidence the authors provide of rising industrial output is for the first half of 1946, but this, as we have shown, was a period during which recovery policy was subordinated to Soviet reparations demands. Even after the recovery of real government domestic spending between February and May 1946 from its winter low-point, it only reached about 59 percent of its August – September 1945 level (Table 1). So, given the probable relative inflexibility of current consumption outlays, it seems unlikely that government was able to devote significant sums to reconstruction programmes in the first half of 1946, even with the help of the paltry private savings stimulated by the tax-pengő scheme. Rather, the rise in industrial output must surely have resulted from the re-supply of industry with materials to meet Soviet reparations requirements.

In conclusion, hyperinflation (as an inadequate and wasting substitute for fiscal taxation, and a destroyer of private savings) hindered recovery in 1945. In 1946 the hyperinflation continued not as a recovery policy but as the outcome of Soviet policy for extracting reparations without permitting a tax reform. Even from the Soviet standpoint, hyperinflation was inefficient as a means of financing reparations, but increased reparations deliveries further deprived Hungary of its already exiguous resources for reconstruction.

A final point. Grossman and Horváth mention in passing that the inflation rate for the pengő "finally" – i.e. in July 1946 – reached a *daily* 150,000 percent.[51] This is impossible. Nobody will deal for money that depreciates at such a rate. The tax-pengő, formerly an index-accounting device, started to be emitted as a paper currency in its own right at the end of May, because nobody wanted to trade for regular pengős. Early in July the central bank ceased to issue new regular pengő notes, and by the 15th July the entire circulation of regular pengős was (notionally) worth a mere 390 pengős of 1939 value.[52] Between 9 and 28 of July, when

[50] Siklos, *War finance*, pp. 165-6. Siklos's figure for rail freights is however wholly at variance with other accounts, including that of Grossman and Horváth ('Hungarian Hyperinflation', p. 426.)

[51] Grossman and Horváth, 'Hungarian hyperinflation', p. 407.

[52] As estimated from Table 21. 6 of R. Notel, 'International finance and monetary reforms', in Kaser and Radice, *Economic History*, p. 539.

the currency de facto stabilised, the inflation rate in tax-pengős - now the only fiat currency - was 41 percent a day. Even this rate was too high for it to be acceptable as a trading medium. Foreign exchange and commodity monies, especially lard and "broken-gold" effectively displaced it.[53] The fiction of the fantastic inflation of the regular pengő in July of 1946 only survives because government continued to maintain accounts in regular pengős, at an exchange rate against tax-pengős which was meaningless, as the regular pengő had ceased to exist.

[53] Mark, 'View from Hungary', p. 202; Banyai, *Legal and Monetary Aspects*, p. 7; P. Falush, 'The Hungarian hyperinflation of 1945-46', *National Westminster Bank Quarterly Review*, August 1976, p. 53; *Reports ... National Bank of Hungary*, p. xiii.