

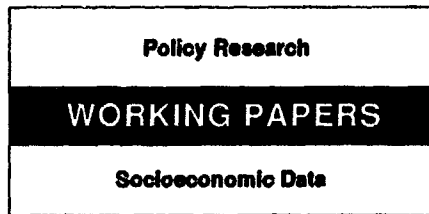
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Inflation in Czechoslovakia 1985-91

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Hidden and suppressed inflation in Czechoslovakia in 1985-91 — reflected in long waiting lists for cars and state and cooperative flats — was relatively slight for the economy as a whole, and it virtually disappeared when prices rose after prices liberalized in 1990-91.



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Drabek, Janacek, and Tuma assess inflation in Czechoslovakia between 1985 and 1991 and identify the main causes of inflation through a literature survey and empirical studies.

The official prices in centrally planned economies were never perceived by central planners to be fully market clearing. Only by coincidence would the overall price level correspond to the level associated with general equilibrium.

What is missing in official price indices in centrally planned economies — including the consumer price index — is "suppressed" inflation, manifest in queuing for products, forced substitution of demand, and forced savings. Also missing is "hidden" inflation, associated with practices that disguise price increases behind "cosmetic" or other changes in product quality.

Drabek, Janacek, and Tuma argue that inflationary pressures in Czechoslovakia in 1985-89 originated mainly in the investment sector. Even though the investment sector was strictly controlled, making it difficult for open inflation to emerge, the scope for inflationary pressures was great in Czechoslovakia. Such pressures arose from a mixture of factors, including poor investment planning, accommodating government finance, and the high priority given to investments and social consumption.

For Czechoslovakia, the official price indices show virtually no inflation between 1985 and 1989, when there were long waiting lists for such products as cars and state and cooperative flats. Trends in these price indices do not seem to depend on the method used for constructing them, according to the sensitivity tests conducted by Czechoslovakia's Federal Statistical Office. Obviously, the official price indices failed to capture the full extent of economic disequilibrium in that period.

But the extent to which official price indices understated inflationary pressures was not serious in Czechoslovakia, compared with other centrally planned economies. Estimates of hidden inflation for 1985-89 range from 0.5 percent to 2 percent a year in consumer markets and about 3 percent in the industrial sector. Estimates for suppressed inflation were less than 5 percent. The relatively small inflationary gap is indirectly confirmed by the sharp inflation associated with the recent price liberalization that subsided in a relatively short period, and both suppressed and hidden inflations have virtually disappeared.

Estimates of hidden inflation were based on benchmark price comparisons between Czechoslovakia and such market economies as Austria. Those for suppressed inflation were based on disequilibrium econometric models of asset holdings and on "conjecture tests."

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INFLATION IN CZECHOSLOVAKIA 1985-1991*

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SUMMARY

The paper assesses the extent of inflation in Czechoslovakia during the period 1985-91 and identifies the main causes of inflation, based on a literature survey and some empirical studies.

The official prices in centrally planned economies (CPEs) were never perceived by central planners to be fully market-clearing, and the overall price level would, therefore, correspond to the level associated with the general equilibrium only by coincidence. What is missing in CPEs' official price indices including the consumer price index (CPI) is the "suppressed" inflation, which is manifested in queuing for products, forced substitution of demand and forced savings. Also missing is the "hidden" inflation, which is associated with the practices that disguise price increases behind "cosmetic" or other changes in product quality.

The paper argues that inflationary pressures in Czechoslovakia in the period 1985-89 originated mainly in the investment sector. Even though the investment sector was strictly controlled and the emergence of open inflation was extremely difficult, the scope for inflationary pressures was wide in Czechoslovakia. The pressures arose from a mixture of factors - high priority given to investments and social consumption, poor investment planning, and the accommodating government finance.

In Czechoslovakia, the official price indices show virtually no inflation between 1985 and 1989 when there were long waiting lists for such products as cars and state and cooperative flats. Trends in these price indices do not seem to depend on the methodology used for constructing them, according to the sensitivity tests conducted by the Federal Statistical Office of Czechoslovakia. Obviously, the official price indices of Czechoslovakia failed to capture the full extent of economic disequilibrium during that period.

The paper finds, however, that the extent of understatement by the official price indices of inflationary pressures was not serious, especially compared to other CPEs. Estimates of hidden inflation for 1985-89 range from 0.5 percent to 2 percent per year in consumer markets and about 3 percent in the industrial sector. Those for suppressed inflation were less than 5 percent. The relatively small inflationary gap is indirectly confirmed by the fact that the sharp inflation associated with the recent price liberalization has subsided over a relatively short period.

The paper discusses the methods used for the estimates of hidden and suppressed inflation. It indicates that estimates of the hidden inflation were based on benchmark price comparisons between Czechoslovakia and market economies such as Austria, and those for the suppressed inflation, based on disequilibrium econometric models on asset holdings and "conjuncture tests."

Finally, the paper discusses the 1990-91 price liberalization and the associated price rises, showing that both suppressed and hidden inflation have virtually disappeared now.

INFLATION IN CZECHOSLOVAKIA, 1985-1991¹

Introduction

The purpose of this paper is to assess inflation in Czechoslovakia in the period of 1985-1991 and to identify its causes. We shall show that the period has been characterized by inflationary pressures, which were translated partly into open inflation and partly into suppressed and hidden inflation until full price liberalization was introduced in January 1991. Since then, inflationary pressures have been fully channeled into open inflation.

Inflation measurement is dependent on availability and reliability of data. The expertise of Czechoslovak statisticians and statistical offices is reasonable. Czechoslovak price data, however, are problematic, difficult to interpret and not available for certain specific uses.

While the measurement problems are generally known, the way in which Czechoslovak economists and statisticians have addressed these questions is less familiar. The literature is quite plentiful but most, if not all, has been written in Czech or Slovak. In addition, a large number of these studies have appeared in semi-official publications, so that they have not been easily accessible. Given the wealth of material and economic talent, the lack of information about the Czechoslovak literature has been a disappointing gap in understanding economic issues of Central Europe. The paper draws conclusions from a survey of relevant Czechoslovak literature and authors' analyses of limitedly available data.

The period 1990-1991 is analyzed separately in this study. The main reason is the economic reform that followed political changes in November 1989 and led to partial price liberalization in 1990 and full price liberalization in 1991. As a result, inflationary pressures were released much more intensively through open inflation in 1990 and fully in 1991. The increase in price levels in 1990 and 1991 represents partly the size of the monetary overhang accumulated by the end of 1989. Of course, inflation in these two years was fed through other channels as well, as we shall argue in the text. Nevertheless, the highly restrictive macroeconomic policy, which accompanied the reform, was instrumental in minimizing the importance of these channels.

¹We would like to thank Mr. I. Suján and Mrs. Kocianová (Federal Statistical Office), and Mr. E. Šip (Federal Ministry of Finance) for their assistance in providing data and helpful suggestions. Thanks are also due to Richard Porter, John Flemming, Jong-Goo Park, participants of The World Bank workshop and the anonymous reviewer for the helpful comments on the first draft of the paper. The usual disclaimer holds - none of these persons is responsible for any shortcomings which may still remain and the views expressed in the paper do not represent the views of the World Bank or its member countries.

The paper consists of four main parts. Section I discusses Czechoslovakia's inflation during 1985-89, including types of inflation and their nature and causes. Section 2 is devoted to inflation indicators, starting with official indices and continuing with various indicators of disequilibria. In Section 3, we review the recent period, 1990-1991, and discuss the role of inflation during the transition process. Our conclusions are presented in Section 4.

1. Inflation in 1985-1989

1.1 "Types" of Inflation

As numerous Czechoslovak studies show, inflationary parameters were "built in" and they were a generic feature of the traditional centrally planned economy. They manifested themselves as a continuous aggregate demand overhang, as a gap between demand for economic resources on the part of economic subjects, and the available disposable resources.²

In addition to systemic causes, two other factors contributed to inflation in Czechoslovakia: the type of economic policy and external causes (such as rising import prices and other external shocks). All the inflationary factors may have intertwined but systemic causes were decisive for inflationary trends in Czechoslovakia in the period analyzed here, i.e., in the second half of the 1980s.

As shown in Section 2, all three types of inflation coexisted in the Czechoslovak economy: first, there was open inflation, seen in the growth of consumer prices (in the Consumer Price Index, CPI). The price level increased as a result of autonomous pressures, such as the existence of persistent excess demand in the (partial) consumer goods market, which had to be accommodated by decisions of central authorities to raise prices. But this was only one of several ways in which disequilibrium demonstrated itself in a centrally planned economy.

The second type of macroeconomic disequilibrium was suppressed inflation. Rigidity of prices, exchange rates, wages, and interest rates meant that prices in markets for goods, services, foreign currency and labor did not usually balance supply and demand; this resulted in demand overhang for goods and services on the one hand and excess money holdings on the other. Together with administrative allocations of inputs, price rigidity was another important factor that brought about a highly inelastic supply response. The demand overhang also resulted in searches for goods in short supply, "forced" substitution and "forced" savings, queuing, rationing systems, waiting lists, and other alternative mechanisms of allocation. Typical in Czechoslovakia were waiting lists for state and cooperative flats, and, at the end of the 1980s, for cars. In that case, disequilibrium was not accompanied by a corresponding increase in prices

²In the view of most Czechoslovak economists, the primary cause of disequilibrium at the macroeconomic level lies in a centrally planned economy on the demand side. The principal role of demand inflation, however, does not mean that cost inflation plays no role, and that there is no feedback between cost and demand inflation. The enduring demand overhang in the investment sector, and in some parts of the sector of materials and intermediary products, creates a favorable climate for cost-push inflation. However, the transmission mechanism of inflationary pressures was not the same as in market economics and has not been fully understood.

for apartments and cars. Nevertheless, the general shortages have been accompanied by high costs in searching for goods, as reflected in the value of time lost in queuing, hunting for goods, and other makeshift solutions.³

The third type of inflation was hidden inflation. Growth of some prices was not reflected in the official price indexes (mainly, this was true for prices of investment goods, but it was also seen in the form of the so-called "product quality upgrading"). Also, there were hidden price increases. As the quality of an item went down without a corresponding drop in price, ceteris paribus, its implicit price increased (due to quality deterioration), although the explicit price remained unchanged. This downward price rigidity represented, in fact, an inflationary pressure. Pari passu, the official price index covered only part of the movement in price level. The implicit price increase, as well as that part of the explicit price increase which reflected the "product-quality upgrading" noted above, were not included. All this has led to various attempts to measure suppressed and hidden inflation (see Section 2) in order to get a "true" measure of inflation.

1.2 An International Comparison

We strongly believe that in Czechoslovakia, hidden and suppressed inflation were significantly lower than in Poland and Hungary (see, for instance, Portes (1977)). This can be explained by several factors. First, Czechoslovakia had already established a tradition of tight monetary discipline in the inter-war period. This tradition continued in the centrally-planned period.⁴ The tight financial policy has been demonstrated, for example, during the whole post-war period, including the 1980s, by strict wage policy reflected in a relatively tight control of wages and other incomes. This can be documented by the relative success in keeping the growth rate of wages below that of labor productivity, calculated here as changes in output in constant prices for labor input. In 1985, the ratio of growth of wages to growth of productivity was only 0.51; i.e., for every increase of labor productivity by 1 percent, wages increased by 0.51 percent. The corresponding figures for 1986 and 1987 were 0.44 and 0.76 percent, respectively. The loosening of central control in 1988 and 1989 resulted in convergence of the two growth rates; the ratios were 1.00 for 1988, and 0.99 for 1989. Even in these years, however, the growth of wages did not exceed the rate of labor productivity growth, thanks to a mix of direct and indirect controls over the growth of incomes.

Income transfers from abroad could potentially be another source of demand inflation. They played a relatively important part in the "dollarization" of the Polish economy, but they

³ These additional costs represented, of course, a shift towards a lower order of consumer utility.

⁴ The monetary policy of the inter-war period is well described in Kaser and Radice [1985]. The monetary policy under central planning is reviewed in Garvy [1977].

have been less significant in Czechoslovakia. The inflationary nature of income transfers from abroad in Poland came from uncontrolled inflow of foreign currency, which was not sterilized by monetary authorities. This was partly due to the fact that a large part of these transfers took place outside the banking sector. Moreover, even when the funds were channeled through the banking sector, the control over money stock was limited due to difficulties in controlling bank lending. Throughout the 1980s, income transfers represented about 3 percent of total incomes and their share was kept relatively stable. In addition, the so-called "dollarization" of the economy was only marginal in Czechoslovakia compared with Poland.

Also, the long-term policy of equilibrium in the balance of payments (with both deficits and surpluses kept low) did not bring any significant inflationary pressures into the economy. It is well known that balance of payments disequilibria could be a major source of inflation. The transmission mechanisms have been explained in a model based on a stylized centrally planned economy in Drabek (1985) and Wolf (1978) and with specific applications to the economy of the former Soviet Union by Tremblay for the US Department of Labor in mid-1980s. Hence, again the basic idea was the inability, and some unwillingness, of monetary authorities to "mop up" excess liquidity stemming from balance of payments surpluses in domestic currency or to restrain the policy-induced growth of money supply following the outflow of currency in the case of balance of payment deficits.

The conduct of monetary policies was, we believe, also relatively effective. Even though the role of money was limited as in other centrally planned economies, the monetary authorities were very conscious of and followed very closely, movements of monetary aggregates. Moreover, a conscious effort was made to regulate the growth of money supply. In the course of the second half of the 1980s, for example, it was recommended that the growth of money supply be linked to the growth of real gross national income with the aim of limiting the inflationary impact of rapid growth of money supply (see Kocarnik [1987]). Policies toward deposit interest rates were relatively flexible, and the authorities took concrete steps to mop up liquidity from the savings banks.

To repeat, the outcome of such policies in Czechoslovakia was that the inflationary pressures (channeled through all three types of inflation) were lower during the 1980s than, for instance, in Poland and Hungary. This also had important consequences for the price adjustment that occurred in these three countries after the liberalization of prices (see section 3).

Analysis of the causes of inflation in Czechoslovakia, and the paths through which it spread, reveals the importance of different "segments" within the economy, and of specific mechanisms of inflation spillover among the segments. The existence of discrete segments originated in the differences in the decision-making processes. It was also caused by differing degrees of monetization within the economy - by a de facto coexistence of various "types of money" in the total money supply. As a result, the inflationary process and its time horizon can be divided into two separate components - consumer goods and investment goods sectors.

1.3 Investment-Induced Inflation

The centrally-planned economy created a "soft," non-parametric environment for government and enterprise decision-making in production and investment. For Czechoslovakia, analyses conclude that investment was the main cause and generating force of inflation over time. Inflation was tied both to the level of investment and to its structure, varying with particular sectors and industries. The close tie between investment and inflation arose primarily from the absence - both at the macro- and microeconomic levels - of effective economic criteria and/or limits on efficient allocation of investment. Clearly, these inefficiencies had to be accommodated by monetary policies.

The origins of this argument go back to the work of a leading Czechoslovak economist Josef Goldmann, who elaborated in the 1960s a model of investment-induced business cycles under socialism. In brief, his analysis was as follows: At the beginning of every five-year planning cycle, the tendency was great to increase the investment ratio and to start new investment projects. This was caused by the well known "investment hunger" of enterprises, which was financed through the central budget and monetized. In the third year of the planning period, this investment wave usually encountered constraints in the capacity of the investment producing sector. The result was delays in investment completion, cancellations of projects and a need to adapt the volume of investment to the limits of capacity. Delays in investment completion had an inflationary impact due to the failure to meet planned output increases, which subsequently caused an increase in money supply. In Czechoslovakia in the 1950s and 1960s, three such investment waves were documented; the third even led to a collapse of the third five-year plan in 1963 (See Goldmann - Kouba [1967].)

In contrast to the traditional arguments about disequilibrium in the CPE, Goldmann and Kouba and their followers identified two sources of inflation - the consumer goods and investment goods markets. In the consumer goods market, inflationary pressures were transmitted in two ways. In general, equilibrium in the consumer goods market was influenced by the success of central regulation of wages and prices; by production capacities and growth of productivity in the consumer goods, food and service industries; by flexibility of producers in these industries and by the ability of the economy to produce export goods convertible into sufficient imports of consumer products.⁵ As is already well known from the general literature, the wage regulations were not foolproof, and the supply of consumer goods was not able to avert inflation.

1.4 Inflationary Expectations

The other transmission mechanism for inflationary pressures in the consumer goods markets was the spillover effect of inflationary pressures from the investment goods market. The

⁵ The Czechoslovak authorities were reluctant to borrow to finance current account deficits. The value of deficits was, therefore, heavily dependant on export competitiveness.

argument was based on the role of expectations. In a general inflationary climate, other economic entities (households, enterprises and the government) were not just passive takers of inflation even under central planning. In their behavior, they anticipated some degree of inflation, and these inflationary expectations were translated into the construction of plan targets and household decisions. This could contribute to additional inflationary pressures. In a market economy, price increases in the investment sector, for example, had a double impact: demand (income) effect for the initiators of the price increase and cost effect for the buyers of investment goods. Both the income and the cost effects fed further inflation. Through the cost increase, inflation was spread to final production. Even though they did not spell out their theory in detail, several Czechoslovak economists believed that the transmission mechanism was very similar to the one operating in a market economy as discussed above, although not as straightforward.⁶

1.5 Monetization of Imbalances

The crucial question is why underfulfillment plan targets were monetized. According to many observers, one answer is the chronic imbalances between aggregate spending and overall resource mobilization, which originated in an excessive demands for resources (i.e., plan targets of aggregate spending), underfulfillment of investment output targets combined with unsatisfactory supply of consumer goods. This disequilibrium, which was permanently monetized, was induced by inconsistencies in the principal goals of the economic system.⁷ On the one hand, definite social-economic goals were postulated concerning the character of consumption (ample "social incomes", high share of "social funds" in financing public consumption, low rents in housing, low prices of services, equalization of incomes) - all this to be realized mainly through the state budget. On the other hand, no corresponding measures were taken on the supply side in production and imports of consumer goods (in the second half of the 1980s, for example, the share of imported consumer goods never exceeded 11 percent of the retail turnover).

At the same time, the planners favored the growth of investment-intensive industries. One implication of this preference was the investment share in national income was high and rigid. Combined with the high share of social consumption in total aggregate spending, this made real aggregate spending difficult to adjust downward. Another implication was to give preference to producer-goods industries rather than industries producing for final consumption whenever there were competing claims on resources at the margin.

This imbalance did not appear on the level of plan construction, but it emerged once the targets were implemented. Of course, the government tried to balance the growth of incomes with the capacity of the economy to supply consumer goods and services. But periodical

⁶For further details, see Kupka [1983].

⁷Another reason was mistakes in plan construction, but these tended to be random, i.e., without a specific bias in planning the overall macrobalance.

over-investment, resulting from unplanned delays in completion of new capacities and poor return on investments, precluded the planned contribution of investment to output and income. As a result, some or all wage payments could not be financed from revenues of suppliers of investment goods. This called for additional assistance to be provided to the investment goods sector in the form of income or price subsidies, subsidized credit, or permission to prices. The lack of wage adjustment, combined with budgetary transfers, created additional pressures to balance the budget - by offsetting the additional budgetary expenditures with Central bank financing, by upward price adjustment or additional taxation (profit deductions).⁸ The two of these instruments of financing were directly inflationary, while taxation was indirectly inflationary because it reduced the net profitability of enterprises and hence their incentive to supply goods and/or induced them to their prices.⁹

The transmission mechanism described above is what many economists in Czechoslovakia meant when they argued that wages in the investment sector had no adequate counterpart in consumer goods. Some economists have even argued that the multiplier effect of investment on wages could disrupt the original intentions of planners. They argued that the central plan usually took into account this multiplier effect only partially, reflecting only its first round. Secondary and further multiplier effects were not respected *ex ante* by the plan. As soon as the multiplier effect of investment began to affect consumer incomes, there were attempts to check it by further balances. This situation has been called "permanent planning" - meaning, in fact, that real economic trends were *ex post* implanted into the plan.¹⁰

1.6 Monopolistic Structure

The lack of control over enterprises in the producer price sector was also related to a specific industrial structure. In Czechoslovakia, many enterprises were monopolistic producers of some goods. These enterprises strived (mostly with success) not only to pass the increases in prices of inputs onto their output prices; they also endeavored to take advantage of inflation by additionally increasing prices and by demanding subsidies or tax relief. Thanks to lack of competition from abroad, this behavior was feasible.

⁸Theoretically, the Government could use two additional sources of financing - bank borrowing and external borrowing. The effect of bank borrowing on domestic price level could have been the same as the effect of Central Bank financing of the budget deficit. The reason was that the banking system was simply an extension of the budget with limited scope for its own resource mobilization. External borrowing was not significant because of government policy to restrict it.

⁹This, of course, does not mean that enterprises were free to set their prices or that they were profit maximizers. However, the link between profits and labor input was strong enough to affect variations in the level and structure of output.

¹⁰See Janacek et al. [1970].

The planners were tried through economic policy and central planning to prevent the transmission of inflation from the investment sector to the consumer market, as well as to put an end to the origin of inflationary pressures. Politically, this was not always possible in view of the close links between enterprise managers and the Party. Nevertheless, thanks to measures mentioned above (control of money supply, income and wage regulation), planners partly succeeded. As shown in Section 2, there was a difference between suppressed and hidden inflation in the investment sector (estimated at roughly 5 percent annually in the 1980s) and in the consumer market (2 percent annually).¹¹

2. Inflation Estimators

2.1 Official Indices

Changes in the price level are typically measured by consumer price index (CPI), producer price index (PPI) and GNP (GDP) deflator. The first two indices are published in Czechoslovakia by the Federal Statistical Office (FSO), whereas GNP deflator was not available in the past because the GNP has not been computed until recently. However, by comparing net material product (NMP) - an alternative indicator used by central planners - in current and constant prices, one can compute an NMP deflator. CPI remains most popular, because it reflects the impact of prices, on the standard of living. (All available indices from 1980 are shown in Tables I and II in the appendix.)

CPI was computed as "full"-- that is to say it covered all retail sales, and weights were taken (until 1991) from expenditures in retail trade. The methodology has been changed recently, due to the discontinuation of data on retail expenditures. The weights are estimated from "family surveys."¹² The problem of weights is clearly most important because the use of Laspeyres index leads to comparing aggregates with different weights. In the past the weights have been regularly changed, typically once every five years. The current weights use 1989 as the base year and will be kept until 1993. The FSO carries out a sensitivity test each quarter by recalculating the Laspeyres indices with Paasche indices to assess the importance of weights. The most recent test at FSO showed that the differences between both series are rather small and the Paasche index is slightly lower, with differences ranging from 1 to 3 points. However, it must

¹¹The different rates of inflation in these two sectors could also reflect different rates of productivity growth. In brief, the inflation pattern was most likely determined both by the effects of policy and by different growth rates of productivity. It should also be kept in mind that there were always some "markets" for stocks of unsalable products, and that some capacities were not always fully underutilized. This was particularly the case of the intermediary sector, in which a simultaneous presence of shortages and excessive stocks could be often observed.

¹²The surveys provide cross-section data and are based on the family budget data; the size of the sample is 5,500 households.

be kept in mind that Paasche methodology tends to lower the value of the calculated index in "normal" market situations¹³ because of the way in which the weights are used. Paasche index uses current-year weights. The sample used by FSO covered 1,065 items until the end of 1991, but it was reduced to 823 items on Jan. 1, 1992. This reduction was not only possible but also necessary. On the one hand, data have not been easily available, due mainly to the decentralization and privatization of retail sector. That has meant that it is now much more difficult to monitor the retail sector in such detail as was true under central planning. On the other hand, the experience from Western economies shows that smaller samples are sufficient.

According to the official estimates of CPI and PPI, there was virtually no open inflation between 1985 and 1989. Table I suggests that inflation hardly increased between 1986 and 1989 after peaking in 1985 at 2.7 percent annually. The inflation picked up in 1990 (10.0 percent) when the first price liberalization steps were taken and it accelerated to almost 58 percent in 1991, when full price liberalization was implemented. The story is virtually the same for all groups of consumer purchases.

The picture is similar when we assess the movement of PPI. Producer prices were characterized by relative stability between 1985 and 1989, except for a decline in 1989 according to the official sources. But they increased considerably in 1990, and dramatically in 1991.

The official CPI does not reflect the "true" inflation for several reasons. As described above, centrally planned economies exhibit hidden and suppressed inflation which, by definition, are not included in the official index. Remember, hidden inflation is an adjustment going "outside" the official index. It refers either to explicit price changes that do not enter into the official CPI, or implicit price changes that occur when the price level is seemingly the same but quality of goods is worse at that same price. Suppressed inflation is a state of internal macroeconomic disequilibrium in which aggregate domestic demand exceeds aggregate domestic supply without simultaneous price adjustment.

There have been other attempts in Czechoslovakia to tackle hidden and suppressed inflation empirically. These can be divided into two groups. The first includes studies based on the influential approach derived from disequilibrium theory and modelling. The second group includes a wide range of "ad hoc" indicators that are often treated as proxies for hidden and suppressed inflation. The most frequently used are estimates based on the purchasing power parity (PPP) theory, various derivatives of savings, black exchange rates, specific survey-oriented methods, and macroindices of shortages. All these studies have been subject to considerable controversy and discussion in the country, similar to parallel discussions abroad.

¹³It is normally assumed that faster growth of volumes is associated with slower growth of prices for particular commodities and vice versa. The Paasche index gives higher weight to slowly increasing prices, which tends to lower aggregate prices increase over time. There is no a priori reason to believe that the pattern of price-volume changes was different in centrally planned economies.

The outcome of local discussion is not entirely conclusive even though most writers agree on several important points, as we shall see below. We shall start with estimates based on the disequilibrium theory.

2.2 Disequilibrium Theory and Inflation

The disequilibrium approach, originally pioneered by R. Barro and H. Grossman in the early 1970s (Barro-Grossman [1971, 1974, 1976]), was first applied in modelling CPEs by R. Portes, see e.g. Portes and Winter [1980], and later developed by many others. In Czechoslovakia the most important followers were Dlouhy or Dlouhy and Dyba (1985) and V. Rudlovcaak (1987, 1988).

All applications, either related to the consumer market only (Dlouhy [1989], Rudlovcaak [1988]) or covering the linkage between consumer and labor markets¹⁴ (Dlouhy (1984), Dlouhy-Dyba (1985)), are open to the standard criticism of disequilibrium modelling (see, for instance, Kornai (1980) or Winiecki (1985). Not even later developments incorporating rational expectations and plan data¹⁵ changed the fundamentals of the approach. The major concern of critics is with the "min-condition" which states that there cannot be excess supply and excess demand in the market at the same time. The simplest disequilibrium model looks like this:

$$(1) \quad Q_t^d = a X_t + e_t$$

$$(2) \quad Q_t^s = b Y_t + d_t$$

$$(3) \quad Q_t = \min (Q_t^d, Q_t^s)$$

where Q^d , Q^s represent demand and supply, respectively; a , b are row vectors of parameters; X and Y are column vectors of explanatory variables to be explained further in the text below; e , d are random terms; and Q is an actual size of transactions. Subscript t refers to time period. It is obvious that this is a highly simplified model of macroeconomic disequilibrium. The min-condition equation does not capture simultaneous disequilibria in individual markets. Nor does it capture the spillovers from a particular market to others. These issues have been amply discussed in the literature - for example in the analysis of the 'aggregation problem'. In addition, the model refers to the goods market only, with no attempt to integrate it with labor

¹⁴This linkage is ideologically based on the supply multiplier developed by Barro Grossman (1974). An alternative approach has recently been proposed by Feltenstein and Ha (1992). Their model tests for suppressed inflation by estimating a "true" rate of inflation that explains behavior of observed money demand.

¹⁵In Czechoslovak literature, the plan data were used by Rudlovcaak (1987).

or other markets. Further, it deals with the consumer market only and does not include investment and intermediate products markets. But as we have shown above, the latter markets are often in disequilibria in CPEs.

Due to space limitations, the following discussion refers only to most recent estimates (Rudlovčák [1987, 1988]; Dlouhy [1989]). Both writers found that there had not been any systematic excess demand in the Czechoslovak consumer market in the periods they studied, 1960-1984 and 1975 -1988, respectively. Even though consistent with the official data noted above and intuitively appealing, the findings contradict other indicators, such as "conjuncture tests" and derivatives of savings, which reveal permanent, though not substantial, disequilibrium in the consumer market. These methods are discussed in the next section.¹⁶

Both Rudlovčák [1987, 1988] and Dlouhy [1989] used Houthakker-Taylor demand function that had been previously applied to Czechoslovak savings data by Klaus and Rudlovčák [1977]. The demand function was not a source of differences among various estimates within the disequilibrium framework; it was typically based on household incomes and their savings. Major disputes were concerned principally with specifications of the supply function. Rudlovčák incorporated into the specification of the supply function the household total income and expenditures, which were specified in the government plan, and a proxy variable to reflect the state of equilibrium in the market and the likely response of the planning center. Dlouhy [1989] - reestimating the Portes-Winter model - used their original specification based on the assumption that the planning center responds mainly to fluctuations in gross agriculture production and household money balances.¹⁷ As noted above, both Dlouhy and Rudlovčák found that there were regimes of excess demand as well as of excess supply. The problem is that periods which were considered by most observers to be years of large shortages, such as years 1969, 1974, and 1978, were modelled as periods with excess supply. The interpretation is, therefore, very difficult and one must use their results with caution. In contrast, the estimates

¹⁶Strictly speaking, the findings are not contradictory if the findings based on the disequilibrium model are interpreted as flows while the findings based on "conjuncture tests" and on savings derivatives as stocks. The latter - implying the presence of rationing systems - could indeed be a permanent feature in markets with no clear trend of suppressed inflation as defined in the text above.

¹⁷Dlouhy also reestimated the Burkett model in which he tried to take into account the reservations to the min-condition noted above. Burkett's modified model assumes that the min-condition holds at micro-level and that the aggregation comes afterwards. The impact on results is not substantial.

for the 1980s were more robust, and confirmed the general perceptions about permanent excess demand in the 1980s.¹⁸

While they provide a useful tool for modeling and, therefore, understanding the CPEs, it is quite evident that the studies based on the disequilibrium framework have remained controversial. In particular, the empirical tests of the disequilibrium theory have not led to unambiguous and robust results and the theoretical underpinnings also have been contested. Fine changes in model specifications lead to considerably different results.

2.3 Savings and its Derivatives

Another method widely used and tested in Czechoslovakia draws on the concept of "forced savings." This concept is based on the idea that households are unable to purchase some goods and services they want because of shortages in those items, so the only thing they can do with "excess" money is put it into savings accounts. The presence of "forced" savings would, therefore, indicate excess demand for goods and services and excess supply of money balances (savings). The fundamental question of empirical research is how to recognize savings or parts thereof which are "forced."

An approach to identify and measure "forced" savings, suggested by Pindak [1983], stems from the conjecture that household savings must be related to another variable such as income or sales. Pindak chose three indicators whose movement could be theoretically related to the emergence of suppressed inflation: the average propensity to save, the incremental ratio of money holdings, and the income velocity of household money holdings.¹⁹ A similar approach has been adopted by Winiecki [1985], who proposed another indicator, namely the ratio of savings to retail sales (See Table IV.) Pindak himself was aware of two fundamental shortcomings of his methodology. First, it is assumed that no adjustment of official goods markets takes place through parallel markets, and second, the indicators do not take into account so-called "forced" substitution. In addition, the savings function must be stable over time and savings must be determined only by income.

¹⁸The period was covered only by Dlouhy, while RudlovcaK covered only the period 1971-1984. Dlouhy's results for the 1980s have been confirmed by Charemza [1991] who specified the supply equation by a random walk process with drift. The findings have pointed to a permanent excess demand in the 1980s in Czechoslovakia, but the extent of disequilibrium is different in comparison to that generated by Dlouhy's model. By and large, these findings are consistent with those of Feltenstein and Ha (1992), who find only small suppressed inflation for the period of the 1980s.

¹⁹For definitions of these terms, see notes to Table IV in the appendix.

The concept of "forced" substitution is particularly relevant in CPEs. Consumers in "shortage" economy often compensate for their inability to purchase a particular product by buying a substitute. They are said to be "forced" to acquire another product, and there is no doubt that "forced" substitution played its role in equilibrating the consumer market even in Czechoslovakia. Thus, the presence of "forced" substitution will affect the size of ("forced") savings.

Another assumption, potentially less important for Czechoslovakia, concerns the functioning of parallel markets. Following the work of Alexeev and others,²⁰ some - but by no means all -- Czechoslovak economists argue that parallel markets absorb any excess money holdings because prices are free in these markets. It implies that people can always satisfy their demand, with only price determining whether they succeed in doing so. Thus, savings can only be voluntary or speculative; households speculate on finding a better supply in official markets where they can purchase items for relatively low prices or on seeing a decline of prices in parallel markets. Though this approach is theoretically attractive, we do not believe that it is relevant for Czechoslovakia. In the view of many observers, the underground economy in Czechoslovakia has never been sufficiently large, either with respect to commodity or labor markets.

In spite of these objections, most Czechoslovak economists consider savings in Czechoslovakia to be mainly voluntary, with only a small part "forced." They further argue that households' savings decisions are determined both by current economic situation and by expectations. That is to say, attitudes toward savings can shift when rapid economic and institutional changes take place. Thus, a part of savings always represents a potential pressure on the (official) markets.²¹

We decided to carry out a simple test of the theory that savings have, for the most part, been voluntary. We applied the approach of Pindak, Winiecki and others and looked at the changes in various savings-related indicators. We assumed, of course, that savings were tied to a macroeconomic variable through proxy -- typically income or retail sales. Bearing in mind the limitations mentioned above, we can look more closely at the dynamics of these indicators for Czechoslovakia in 1980s (see Table IV).

The figures refer exclusively to households' holdings; we computed three velocities of money, average propensity to consume, incremental ratio of money holdings, and savings-to-sales ratio. The velocity of cash holdings (velocity-C) hovers around the value of 2.50, which

²⁰For the original contributions see eg. Alexeev [1988] or Acharya, Spagat [1991].

²¹The position of these Czechoslovak economists is different from the position in other CPEs. This is in spite of the fact that the dynamics of savings behavior was similar in all CPEs and one would, therefore, expect similar outcomes. However, differences may arise due to institutional and cultural differences or other factors.

means that transactions' demand for money is relatively stable. The slightly decreasing velocity of total savings (velocity-S) reflects only falling velocity of non-cash deposits (velocity-NC), which needs to be explained. On the one hand, this tendency could be brought about by higher speculative balances but, on the other hand, this may be evidence of some "forced" savings. The same tendency - rising ratio of savings or of saving increments to a macroeconomic variable - is confirmed by alternative indicators, such as average propensity to save (APS_{NC}) and savings-to-sales ratio.

All these indicators also show relatively slower development in 1988-1989 and unusually large increases in 1990. The latter year reflects adverse expectations of the public concerning higher purchases and expenditures in general. It may be useful to recall the role of expectations: institutional and economic conditions, and especially anticipated changes in these conditions, may abruptly change the public's attitude to savings.

The question remains how these figures should be interpreted. From Table IV, we can see a clear trend for households to put aside more money than they desire, up to 1987. This means that the households were "forced" to save. We believe that the forced savings created a continuing pressure on the consumer market. This assumes, of course, that savings functions are stable over time, as we noted above. On this assumption, we estimate the forced savings as the difference between the actual savings and those estimated from the stable savings function and found that the share of "forced" savings was on average about 5 percent throughout the 1980s, which means approximately Kcs 1.5 billion per year. If prices were free to adjust during this period, the release of the "forced" savings would contribute by not more than 0.3 percentage point to the CPI. Furthermore, taking into account the likely 5 percent share of "forced" deposits in aggregate household savings, this represents about 4-5 percentage points to inflation after full price liberalization - a fairly small impact.²²

2.4 Conjuncture Test

A unique attempt to identify disequilibrium in the consumer market is the so-called "trade conjuncture" test. The test calculates the value of an indicator (imbalance) and is based on surveys of salesmen in which they are asked about the degree of demand satisfaction. The value

²²Our estimates are very rough: we simply compute hypothetical savings based on APS^{NC} from the previous year and the difference between the hypothetical and actual values are considered as "forced savings. Adding this amount to retail sales and comparing it with the actual sales gives an extra 0.3 percent inflation per annum on average. Similarly, cumulative "forced" savings are supposed to be 5 percent, which - placing the sum on the consumer market - should induce 4-5 percent inflation.

of the indicator (imbalance) varies from -100 to +100; negative values indicate a negative evaluation (shortage), positive values indicate excess supply, zero represents an equilibrium.²³

The major reservation to conjuncture tests is that they do not take into account "forced" substitution and the effect of parallel markets, as do the Pindak and Winiiecki methods.²⁴ The perceived imbalances may therefore be relevant in the partial equilibrium framework but they need not generate an aggregate disequilibrium. In other words, the reported values (see Table V) are related to the *ex ante* disequilibrium in specific markets before some form of adjustment takes place such as "forced" substitution.

Further, it must be born in mind that the conjuncture tests are the result of surveys on expert opinion and thus are subject to the usual problems of sampling and other survey difficulties. On the other hand, they are product-specific and highly disaggregate. That is to say, they provide specific information about individual markets. The authors of the test believe that to the extent that bias exist - either in sampling methods or in responses - the bias should be consistent over time.

The tests have been compiled for many markets, but Table V shows the division into foodstuff and durables only. Rising positive numbers indicate the perception of rising surpluses in shops and vice-versa. The interesting point is that the conjuncture tests in the second half of the 1980s confirm our conclusions from the previous section - namely, that there has been intensive shortage since 1988, reaching a peak in 1990. From this point of view, we should concentrate on non-perishable goods where a sharp worsening of shortage is evident.

2.5 Purchasing Power Parity (PPP) Estimates

So far we have been considering direct estimators of inflation, but it can be also estimated indirectly. One such indirect method is the purchasing power parity technique that leads to estimates of inflation as a by-product of comparisons of purchasing power parties over time. The PPP technique involves a comparison of price levels among countries by comparing the purchasing power of currencies, which leads to an implicit exchange rate of currencies. In

²³As far as we know, Czechoslovakia is the only country which used this kind of indicator. The investigations were performed quarterly and covered the whole retail sector; in 1990, the question about the option of salesmen on demand satisfaction was sent only to firms with over 100 employees. The surveys, which have been conducted by Vyzkumny ustav obchodu (Research Institute of Trade), discontinued after 1990.

²⁴Recall, however, that parallel markets were not sufficiently large in Czechoslovakia and that only a small part of the population participated in them. Nonetheless, two general effects are possible. First, transactions in the "second" economy require more cash, and second, those who become better off can buy more luxury goods that would otherwise not be accessible.

turn, comparisons of implicit exchange rates of currencies based on PPP lead to estimates of relative changes in price levels of given countries.

An important merit of the PPP technique is that it enables one to estimate the differences in price levels between countries. This is particularly important for countries in which the exchange rate does not provide meaningful information about the true scarcity of foreign exchange, a problem that was particularly serious in Czechoslovakia prior to the introduction of economic reform in 1990/91. On the other hand, the technique has a number of well-known shortcomings and limitations. The most serious are: (1) product coverage is incomplete and the analysis is derived from samples; (2) the information is subject to typical problems of sampling; (3) goods and services are not homogenous among these countries, and the estimators must take into account differences in quality; (4) consumer preferences may differ among countries and over time, which leads to the usual index-number problems; (5) the choice of countries to be compared may be biased.

Given these shortcomings, the interpretations of PPP estimated are not straightforward. Nevertheless, the comparison of estimates is often interpreted in the literature on CPEs as an indicator of "hidden" price increases. We can report here a study of Havlik [1985], who compared purchasing power parity in Austria and Czechoslovakia. His conclusion was that purchasing power parity in 1980 amounted to 1 AS = 0.52 Kcs. A similar study performed by the Economic Institute of the Academy of Sciences in Prague in 1967 found PPP 0.70 in 1964. Comparing both PPP indices and using CPI in Austria as the base, Havlik obtained an increase of price level in Czechoslovakia during 1964-1980 amounting to 1.69.²⁵ This means that the average annual inflation in the given period was 3.3 percent, whereas the Czechoslovak authorities admitted only 1.4 percent. Thus, Havlik states, hidden inflation was nearly 2 percent per annum.

A similar technique was used by Nachtigal [1990], who compared nominal and average retail prices.²⁶ The aim of his study was to separate the structural effect of forced substitution, which was assumed to push up the average prices. He estimated that this effect brought about 0.2-0.5 percentage point of "true" inflation. This figure is obviously much less than Havlik suggested.

Reservations to both Havlik's and Nachtigal's studies are quite obvious. Among the problems noted above, the issue of quality adjustments seems particularly serious. Both

²⁵ $CPI_{CS} = CPI_A \cdot PPP_{80}/PPP_{64} = 2.27 * 0.52/0.72 = 1.69$

²⁶The nominal price is the actual price in the market; the average price is obtained by dividing nominal retail sales for a given commodity by the physical amount of sold goods. The information about physical amounts was available only for some commodities so that this indicator cannot cover the whole consumer market.

estimates are based on subjective valuations, and they depend on quality coefficients used in the studies. The theoretical basis of the approach is not entirely clear.

The range of estimated hidden inflation is, therefore, quite wide. The studies show 0.5 percent of hidden inflation as the lowest estimate and 2 percent as the upper boundary during the 1980s. The true value is probably somewhere in the middle, say 1-1.5 percent. Clearly, this is purely a guess, not a figure derived from a rigorous analysis.

2.6 Investment Sector

We have argued above that the investment sector of the economy was the major source of inflation or inflationary pressures in CPEs. Some theoretical arguments for other countries have been provided, for instance by Bauer [1978], Winiecki [1985], and Podkaminer [1985], with no empirical backing. We have also argued that the emerging disequilibria spill partially into the consumer market. Unfortunately, the latter effect has not been analyzed empirically and it is practically impossible to ascertain its importance. A more theoretical attempt at this by Klaus [1985] has not proceeded to empirical results.

What we have today are only estimates of disguised (hidden) inflation in the investment sector. Johanovsky [1987] states that the prices of machinery and equipment (investments) were rising on average by 3.5 percent a year faster than the official index during the last 25-30 years, and prices in construction were rising approximately 2 percent faster. Johanovsky based his approach on a method known in Czechoslovakia as "capacity equivalent." This compares a given capital equipment over time and estimates the productivity improvements. These productivity improvements are then compared with the official price of this technology. Specifically, Johanovsky took prices of the same products in the 1950s and the 1980s, then considered differences in the quality (capacity), which he compared with the official price indices.

A similar expert analysis was performed by Svoboda [1989] who compared technical parameters of 4,000 investments and their prices in various periods. He obtained nearly the same results as Johanovsky. A substantially higher hidden price increase was estimated by Johanovsky for investments where the heterogeneous nature of supplies enabled investors to increase prices; central planners could regulate those prices only with difficulty. The estimate of the price increase in this case ranges between 6 and 7 percent.

A different approach, but with similar results, was chosen by Kolanda [1988]. He based his estimates on export prices of investment goods. His results more or less coincide with those of Johanovsky.²⁷ All these estimates generated by expert studies suffer from a major drawback: they touch upon only a part of the sector, only some segments. Their coverage is,

²⁷Estimates of these experts were reviewed by Nachtigal [1990] who reconciled minor differences and estimated the corresponding deflators of output.

therefore, incomplete and the estimates are not relevant for the investment sector as a whole. More importantly, they assume that productivity gains must be reflected in lower prices - an assumption that quite clearly has no theoretical validity in the behavior of economic agents in the short-run. Nevertheless, the interesting feature of all the above, independent, estimates is that they point to the same direction and roughly to the same figures. In sum, these figures suggest that prices in industry were rising by 3-3.5 percent and in construction by 1.5-2 percent per annum faster than officially reported.

3. Prices in the Transition Period 1990-1991

3.1 Preliminary Steps in 1990 and the Impact on Inflation

The evolution of events in 1990-1991 differs completely from the development in the second half of the 1980s, described above. The new government, established at the end of 1989 and confirmed by the election in 1990, started the transition to a market economy in early 1992. In addition, the economy experienced severe exogenous shocks, mainly the break-up of COMECON and the economic collapse of the Soviet Union. The impact of these, however, did not show up fully until 1991. At the same time, 1990 was a year of discussions and preparations for reform -- a period of preliminary steps rather than one of complete reform. The relevant preliminary steps included removal of retail subsidies and currency devaluations. The basic question in connection with inflation is, therefore, what fueled price increases in the course of 1990 and 1991.

In 1990, the average annual rate of inflation was 10 percent for the economy as a whole, with foodstuffs growing at a rate of 11.1 percent, durables by 10.5 percent, catering service by 8.5 percent, and other services by 7.4 percent (month-by-month increases are shown in Table II). Since price control was still exercised in 1990, the question arises as to what caused these increases.

A major contribution to inflation in 1990 was the administrative changes in retail prices due to abolition of subsidies. Retail prices has been highly subsidized in the past through the so-called negative turnover tax (Kcs 28 billion in 1989). The subsidies were removed to a large extent in July 1990, causing a jump in price levels.²⁸ The action had a major impact on the price of foodstuffs, causing an increase of 24.2 percent or 3.5 points of average inflation on an

²⁸The total effect was determined not only by those Kcs 28 billion, but additional Kcs 5 billion, which were due to adjustments in retail margins.

annual basis.²⁹ Other items, such as oil products, newspapers, cigarettes, tariffs in transportation, etc. contributed 3.7 percentage points of inflation. Thus, the administrative changes are estimated to have increased the average price level by 7.2 percent.

Intensive hoarding at the end of 1990 also helped push prices up - by 18.4 percent in the last quarter. In anticipation of the "big bang" and the price liberalization scheduled for January 1991, the public accelerated its spending. These inflationary expectations would have led to a demand-pull in a standard market environment, but the Czechoslovak economy was still under price controls. Nevertheless, the demand pressures soaked through to prices. This happened through changes in the goods supplied to markets, as firms reduced the supply of lower quality, lower priced items and moved to higher price categories. According to some unofficial estimates, this led to an additional 1.1 percent increase in the price level. That increase has been concentrated in textiles and leather goods, but we suspect that this source of inflation was present in other areas as well. It is impossible, however, to separate this effect from the impact resulting from the removal of subsidies, which was dominant. Thus, the figure mentioned above (7.2 percent) is likely to include this inflationary factor.

The Price Bureau attributes the remaining 1.7 points of inflation to "prices by agreement" and changes in statistical methodology. However, the explanation could also lie in another factor - devaluations of the currency. There were three devaluations in the course of 1990 - in January, October and December. It is obvious that the December devaluation could not have had any impact on the price level in 1990 due to the time lag required for the effects of devaluation to work through the domestic price system. The effect of the October devaluation was, we believe, only negligible for the same reason. On the other hand, the January devaluation could, and we believe did, influence the price level; it could hardly have any impact on the prices charged by domestic firms because they were controlled, but prices of imported consumer goods are likely to have contributed to a higher price level. The crown was devalued by 15 percent and the share of imported goods in the consumer market was 10-15 percent; we, therefore, estimate that the January devaluation might have been responsible for all of the remaining 1.7 percent noted above.

Generally speaking, 1990 was characterized by first steps to liberalize prices and thus to release inflationary pressures - by removing subsidies and devaluations. Nevertheless, due to the institutional and economic continuation of price controls, suppressed and mainly hidden inflation still survived. It changed dramatically at the beginning of 1991.

²⁹Source: Bureau for Prices, Federal Ministry of Finance, mimeo. The computations of the individual figures are based on CPIs of individual items supplied by the Federal Statistical Office. We can also check the figures indirectly. For instance, the price increase in foodstuffs can be verified as follows. The foodstuffs subsidies were approximately Kcs 30 billion, nominal retail sales of foodstuffs Kcs 160 billion; the ratio of nominal to hypothetical real retail sales indicates a price increase of 23 percent ($=160/130$).

3.2 Price Liberalization of 1991

Several Czechoslovak economists have observed that Czechoslovak consumers generally show an extremely high propensity to consume in times of recession and times of pronounced shortages of consumer goods (through "forced" substitutions). Such consumer behavior reflected the fact that those periods also were always characterized by increased inflation - open or hidden. Consequently, the propensity to save declined. This type of behavior differs significantly from usual consumer behavior in a market economy where the propensity to save usually grows in times of recession, as households are trying to cope with growing uncertainty about their future incomes.

The inflationary pattern in the course of 1991 was quite remarkable. As Table III shows, the immediate impact of price liberalization in 1991 was a big jump in the price level in January (CPI increased by 25.8 percent). Following the strict fiscal and monetary policies, inflation very quickly was brought under control. The rate of inflation started to fall in February and continued to decline until July, when no price increase was registered. Inflation essentially disappeared in the second half of the year until November and December, when it rose slightly as a result of further removal of price subsidies, government financing of market support programs for certain commodities (the so-called "fund of market regulation"), sales of new higher-priced agricultural products, and Christmas shopping. The pattern was very similar, not surprisingly, in the case of producer prices.

The high propensity to hoard under the inflationary expectations, particularly in Slovakia, where the process of economic reform faced greater resistance of the public, characterized the beginning of 1991, and was a big factor behind the initial price jump. The slow reaction of domestic enterprises to re-price their products in the market was also cited as a reason for increased demand. Another important factor in the shift of prices was the monopolized structure of the Czechoslovak economy. Sujan [1992] suggested that the lack of competition added 24 percentage points to the annual inflation, which reached 57.8 percent; other factors were internal imbalances (9 points), the increase in import prices due to the break-up of COMECON (6 points), and the effect of devaluations (15 points).³⁰

The slowdown of inflation can be explained by several factors, namely restrictive monetary and fiscal policies, anchoring the exchange rate, wage regulations,³¹ and a change in spending (savings) habits. The last factor is worth discussing. People stopped hoarding

³⁰Sujan's findings have different interpretations. It appears that he compares two time periods in the framework of comparative statistics rather than in a dynamic framework of inflationary process. His results could therefore be better interpreted as a price adjustment between two periods.

³¹The wage-inflation issue is discussed in Sujan [1992b].

goods, because they started to believe in a successful stabilization³², and because their behavior became "standard", that is to say, they were coping with uncertainty about the future through saving (see Table VI). Thus, in spite of their situation, families refrained from immediate consumption and began to rebuild their financial balances. The households' behavior became much more influenced by long-term planning.

This behavior as a response to insecurity exhibited many characteristics of a "classical" consumer -- namely diversification of economic activities that secure financial means for the household, and spreading the risks posed by a deteriorating economic situation.

At the same time, this type of consumer behavior helped to tame inflation; inflationary expectations have gone down after the original outburst following the liberalization of prices. Stabilization policy brought a positive effect, succeeding quickly in bringing inflation down to a very low one-digit level.

A peculiar and not fully explained feature in Czechoslovakia is the different rates of inflation in the Czech and Slovak parts of the country. This suggests a certain structural rigidity in the economy. The Slovakian inflation rate exceeded by 4.6 percentage points. We see three likely reasons for the difference: Once again expectations played a role. The population in the Czech lands seemed to believe in the government's reform commitments more than Slovak did, so the anticipated inflation is higher in Slovakia. Secondly, Slovakia imposed "softer" policies, which justify those adverse expectations. And finally, industry is presumably even more monopolized in Slovakia than in the Czech lands, because Slovakia is more open to lobbying. Most importantly, the absence of an adjustment mechanism that would produce forces to offset the impact of these factors is presumably the major impediment for more effective conduct of macroeconomic policies.

4. Conclusions

The purpose of this paper was to assess the extent of inflation in Czechoslovakia during the period 1985-1991 and identify the likely causes of inflation. It was argued that the official price indices fail to capture the full extent of disequilibrium. What is missing in the official indices such as CPI is "hidden inflation" -- the practices that disguise price increases behind "cosmetic" or other changes in product quality. Moreover, official prices were never perceived by central planners to be fully market-clearing, and the overall price level would, therefore, correspond to the level associated with general equilibrium only by coincidence. An attempt was made in this paper to evaluate the empirical results of disequilibrium models to measure the degree of suppressed inflation.

³²The role of monetary and fiscal policies is analyzed in Tuma [1992].

It was further argued that inflationary pressures in the period 1985-1989 originated mainly in the investment sector. Traditionally, it was the consumer sector where most observers would seek the emergence of inflationary pressures in view of its institutional characteristics. Our argument is different. Even though the investment sector was strictly controlled and the emergence of open inflation was extremely difficult, the scope for inflationary pressures was wide. The pressures themselves arose from a mixture of factors - poor investment planning (micro and macro) and high priority given to investments and social consumption.

The discussion of official price indices was focused on the consumer price index as a leading proxy of inflation measurement and producer prices. Various sensitivity tests performed by the Federal Statistical Office have revealed that official price indices were not significantly affected by the statistical methodology adopted in their construction. The hypothesis of hidden and suppressed inflation had been addressed through a number of approaches. Econometric models in the disequilibrium framework, aiming to specify the extent of excess demand, are heavily dependent on the model specifications and are also difficult to interpret. The favorite indicator of suppressed inflation has been the savings variable. Several variants of this have been computed for the 1980s, and they indicate the presence of some "forced" savings, albeit not substantial. This important conclusion is in line with other tests of suppressed inflation such as the conjuncture tests.

Estimates of hidden inflation are also identified and reviewed. While there is a general agreement about the presence of hidden inflations in the period 1985-1989, there is no consensus about the rate. Estimates range from 0.5 percent to 2 percent in the consumer market and about 3 percent in industry. The different ranges of inflation in the consumer and producer sectors were not atypical in CPEs, in view of the market segmentation noted above.

The most remarkable feature of all the inflation indicators is the relatively low level of inflation in Czechoslovakia, in comparison to most CPEs. We believe that this reflects a better macroeconomic policy. This relatively favorable development had important consequences for the introduction of price liberalization in 1990 and 1991, because prices were liberalized in the presence of a relatively smaller inflationary gap.

The price liberalization of 1990 and 1991 did indeed lead to acceleration of inflation throughout 1990 and to substantial increase in the price level in January 1991. Since then, the rate of inflation has been slowing down and has stabilized at less than 1 percent per month. This paper identifies major causes of inflation escalation (inflationary gap, removal of subsidies, devaluations and expectations) as well as the reasons behind the recent progress in controlling inflation.

As is common, empirical studies of this kind have a number of shortcomings. The authors are well aware of many problems pertaining to computations of various inflation

indicators, as well as to interpretations of the results. Clearly, all the estimates reviewed in this study must be viewed with great caution. Nevertheless, we believe that these problems do not fundamentally alter our basic conclusion - that inflation in Czechoslovakia remained relatively under control, although official data do not sufficiently capture the extent of macroeconomic disequilibrium.

Table I Official price indices, 1980-1991

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
CPI ¹	2.9	0.8	5.1	0.9	0.5	2.7	0.5	0.1	0.2	1.4	10.0	57.9
-foodstuffs	0.2	0.0	9.4	0.6	-0.2	3.6	1.3	0.2	-0.3	0.1	11.1	45.3
-durables	4.4	1.5	1.5	1.1	1.2	0.7	0.7	0.2	0.3	2.6	10.5	72.0
-catering	0.0	0.0	14.1	0.6	-1.4	-3.2	0.5	0.0	0.6	1.0	8.5	57.0
-services	6.5	0.7	0.4	1.1	1.6	-0.3	0.1	-0.1	0.9	0.8	7.4	39.5
PPI ¹												
-industry	1.9	4.8	7.6	-0.3	8.2	1.6	0.0	0.1	0.0	-0.7	4.5	69.9
-cnstructn.	0.0	0.0	8.9	0.0	13.4	0.0	0.0	0.0	0.0	-2.3	6.5	48.7
-investment	0.1	0.4	6.9	0.8	8.5	-0.1	0.2	-0.4	0.3	-1.6	3.9	n.a.
- machns	0.3	1.0	3.1	2.0	0.6	-0.3	0.6	-1.0	0.7	-3.6	0.5	n.a.
-agricultr.	8.4	1.2	9.1	0.4	3.2	0.1	0.7	0.3	-0.2	27.0	3.9	6.8
NMP deflator ²	1.88	1.76	1.14	1.15		1.42	1.99	1.36	1.42	1.38		
GDP deflator											1.13	1.60

Source: Federal Statistical Office and authors' computations

¹ CPI = consumer price index; PPI = producer price index
 1980 - 1985: computed using weights of year 1977, and 1967 for PPI respectively
 1986 - 1990: computed using weights of year 1984

² Both deflators are computed on the base of 1984 (until 1984, the base year is 1977). This is presumably the reason of some inconsistencies among indices: typically, the deflator should be between the values of CPI and PPI.

Table II Official price indices, 1990, quarterly data (to the same period of previous year)

	I	II	III	IV	Average
CPI	3.4	3.9	14.1	18.4	10.0
of which					
foodstuff	0.0	0.2	20.0	24.2	11.1
durables	6.8	7.4	11.0	16.7	10.5
catering	0.2	1.3	15.9	16.2	8.5
services	3.3	3.7	9.9	12.7	7.4
PPI* industry	1.3	1.4	1.5	17.8	5.5
GDP deflator	1.07	1.09	1.14	1.20	1.13

Source: Federal Statistical Office

* 1.1.1984 = 100

Table III Official price indices, 1991, month-on-month changes

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CPI	25.8	7.0	4.7	2.0	1.9	1.8	-0.1	0	0.3	-0.1	1.6	1.2
of which:												
- foodstuffs	31.4	1.0	-2.2	-1.6	-0.5	-0.1	0.4	-0.1	0.8	-0.1	3.5	2.9
- durables	23.0	13.9	11.4	3.9	3.5	0.5	-0.6	-0.1	0	-0.5	0.3	0.5
- catering	43.7	1.8	-1.0	-0.1	-0.3	0.9	0.5	-0.3	-0.2	-0.5	0	1.1
- services	8.6	3.6	1.5	4.8	4.2	12.8	0.6	0.4	0.5	2.5	3.6	0.6
PPI												
- industry	24.0	19.3	0.1	2.9	1.7	-0.8	0.5	0.4	-0.4	0	0.9	0.6
- constructn:												
- work	33.1	8.3 ⁹	1.7 ⁹	0.8 ⁹	2.2 ⁹	0.3 ⁹	1.3	-0.3	-0.2	0.6	0.2	0
- material	42.6	10.4	1.8	1.1	3.3	0.3	-0.3	-0.3	-0.4	0.1	0.3	0
- agricultr.	-	2.7	1.3	-0.6	-1.8	2.9	-0.7	0.4	-3.8	11.5	11.7	11.2

GDP deflator, 1991 - quarterly data

	I	II	III	IV	1991
GDP deflator	1.52	1.52	1.63	1,73	1.60

Source: Federal Statistical Office and authors' computation
⁹ estimate

Table IV Monetary indicators, 1980-1991

		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Disp. inc.	YD	315.90	323.60	338.20	348.40	360.00	372.40	383.70	396.50	413.10	426.80	461.70
Cash	C	121.90	125.80	133.10	139.60	144.70	147.80	153.10	158.30	163.60	170.30	172.30
- change	dC		3.90	7.30	6.50	5.10	3.10	5.30	5.20	5.30	6.70	2.00
Non-cash	NC	73.00	80.20	88.40	98.10	109.00	120.80	134.00	148.20	160.80	171.90	177.20
- change	dNC		7.20	8.20	9.70	10.90	11.80	13.20	14.20	12.60	11.10	5.30
Total svngs	S	194.90	206.00	221.50	237.70	253.70	268.60	287.10	306.50	324.40	342.20	349.50
- change	dS		11.10	15.50	16.20	16.00	14.90	18.50	19.40	17.90	17.80	7.30
Retail	RS	255.10	261.00	268.50	276.90	285.00	296.40	304.70	313.70	329.00	340.50	381.20
Velocity-C	V=YD/C	2.59	2.57	2.54	2.50	2.49	2.52	2.51	2.50	2.53	2.51	2.68
Velocity-S	V=YD/S	1.62	1.57	1.53	1.47	1.42	1.39	1.34	1.29	1.27	1.25	1.32
Velocity-NC	V=YD/NC	4.33	4.03	3.83	3.55	3.30	3.08	2.86	2.68	2.57	2.48	2.61
APS _s	=dS*100/YD		3.43	4.58	4.65	4.44	4.00	4.82	4.89	4.33	4.17	1.58
R=dC*100/YD			1.21	2.16	1.87	1.42	0.83	1.38	1.31	1.28	1.57	0.43
S/RS		0.76	0.79	0.82	0.86	0.89	0.91	0.94	0.98	0.99	1.00	0.92
APS _{NC}	=dNC/YD * 100		2.22	2.42	2.78	3.03	3.17	3.44	3.58	3.05	2.60	1.15

Source: Monetary Surveys of SBCs; Czechoslovak statistics; authors' computations

Note (all figures refer to households' holdings):

C (cash) = currency + demand deposits

NC (non-cash) = time deposits + foreign currency deposits

S (total savings) = C + NC

RS = retail sales

R = incremental ratio of money

Table V Conjuncture tests, 1980-1990

	1980	1981	1982	1983	1984	1985	1986	1987	198 ^a	1989	1990
Aggregate saldo	-12.2	-12.1	-13.2	-3.3	-0.2	0.4	-2.7	-8.7	-15.6	-14.7	-20.8
of which:											
-foodstuffs	-7.1	-9.3	-13.5	4.2	10.1	10.4	10.4	3.0	-2.3	-1.2	-3.2
-durables	-16.6	-14.5	-12.9	-10.0	-9.4	-8.6	-12.1	-17.2	-25.1	-24.5	-36.7

Source: Výzkumný ústav obchodu

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Table VI Households' deposits in 1991

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand dep.	100.1	96.3	95.7	93.4	92.9	92.0	92.6	91.4	91.4	91.6	91.6	92.0
Time dep.	159.4	168.5	171.3	175.4	178.3	180.1	183.7	184.6	186.1	187.4	189.3	214.3
Foreign cur. dep.	10.5	11.8	13.5	15.2	16.9	18.1	19.6	21.6	22.4	23.2		

Source: Monetary surveys of the State Czechoslovak Bank

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