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Permanent Income Hypothesis
on Czech Voucher Privatization*

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**A Test of the Permanent Income Hypothesis
on Czech Voucher Privatization***

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Abstract

The aim of this paper is to test the permanent income hypothesis on Czech voucher privatization. This form of privatization moved state assets to households and represented an unexpected windfall gain for participants of the privatization scheme. Whether the windfall was consumed or saved is tested in the tradition of empirical evidence on the permanent income hypothesis. The analysis based on data from a sample survey suggests that only a small number of transferred assets were cashed in and spent on consumption. This result supports the concept of the permanent income hypothesis.

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I. Introduction

The transition processes in Central and Eastern Europe have drawn the attention of economists since the very beginning of the transition. This general interest is not only in the study of the transition *per se*, but primarily in the use of the entire region as a laboratory for investigating the validity of classic theorems in practice.

In this paper, the "Czech national experiment" (the voucher privatization scheme) shall be used to test the permanent income hypothesis (PIH). The transfer of property to Czech citizens from 1992 to 1994 through the voucher scheme was not anticipated, and can therefore be treated as windfall income. The average size of the windfall is about two months' salary, and more than 60% of the Czech population received such unexpected income. It is straightforward to make a sample survey and to test Friedman's PIH following Kreinin's (1961) recommendation:

Since data concerning the behaviour of windfall income recipients is relatively scanty, and since such data can constitute an important test of the permanent income hypothesis, it is of interest to bring to bear on the hypothesis whatever information is available.

Well-known direct tests of the PIH followed by several other tests are presented in Bodkin (1959) and Kreinin (1961). Both Bodkin and Kreinin analysed whether a one-time windfall income gain is consumed and whether transitory this income is correlated with consumption. A barrier to repeated testing of the PIH is the fact that there have been only a very limited number of situations with a suitable substantial windfall income-gain and few opportunities to sufficiently distinguish the permanent and transitory parts of income. Bodkin used transfers to war veterans who received an unexpected National Service Life Insurance Dividend in 1950, while Kreinin dealt with war reparations paid by Germany to Israeli citizens in 1957/58.

Other unique opportunities for this type of study are the massive privatization programs in transition economies. For the purpose of analysis, the Czech Republic has the advantage of having transparent and fast privatization schemes. Another advantage is the stability of both the economy and consumer behaviour. Six out of ten million Czech citizens participated in voucher privatization, i.e., almost all households. Compared to both Bodkin's and Kreinin's studies, Czech voucher privatization transfers provide a much broader sample for testing the PIH.¹ It allows us to work with the "full" population, avoiding problems with the distribution of windfalls and consumption.

In the next section a brief overview of the Czech economy and voucher privatization is sketched. The third section addresses the crucial issue of the data set which is based on a sample survey. The fourth section reports the findings of the analysis and draws major conclusions.

II. Privatization and Consumption Relationship

A transition economy typically exhibits a sharp decline in output which differs across countries depending primarily on initial conditions such as the monetary overhang, the size of the state sector, the tightness of policies, and the monopoly structure.² In the Czech Republic, the decline in GDP was accompanied by a decline in private consumption occurring only in 1991; consumption has grown steadily and quickly since 1992.

¹ Note that 4% of the Israeli urban population received personal restitution from Germany, and the number of veterans subject to National Service Life Insurance dividends mounted to less than 9% of the US population. Therefore, both windfalls influenced a much smaller portion of the population than the Czech voucher transfer.

² The influence of these factors was tested, for instance, in Shemetilo (1996).

There are several possible interpretations of the behaviour of private consumption during transition. One argument is that a transforming country can exhibit insufficient credibility in the transition program, which leads to a switch to consumption because the public is uncertain about the future level of consumption.³ We do not find this argument appropriate for the Czech Republic since consumption growth consistently exceeds GDP growth by 2-3 percentage points and is accompanied by a very solid level of savings (national savings represented 25% of the GDP in 1995).

The most straightforward and likely explanation of the sharp increase in consumption (about 15% in real terms in 1992) is that it was a compensatory reaction to postponed consumption in 1991 which had been caused by the deregulation of prices. The growth of consumption in subsequent years is due to the closing of the gap between real current consumption and its pre-transition level. Or, in the long-run perspective, it is due to a process of catching up with more developed countries.

Such catching up requires a successful transformation. In the permanent income framework, expectations of a successful transition increase permanent income and hence consumption.⁴ The perception of higher permanent income than current income leads to a temporary lack of liquidity. It is reflected at the macroeconomic level on both sides of the balance of payments: quickly growing demand draws imports and increases the current account deficit. This is financed through the capital account surplus.

³ See Calvo and Végh (1992), or Kiguel and Liviatan (1992).

⁴ It also exerts pressure on wages which grew by over 7% in the Czech economy in 1995.

The privatization process may have (partially) offset the aforementioned lack of liquidity. The Czech method of privatization, primarily voucher privatization and restitution,⁵ offered a unique opportunity for the general public to turn real assets into cash to finance higher expected permanent income and consumption. Voucher privatization itself consisted of the transfer of \$13 bil. USD and approximately 90% of eligible people (those 18 years old and over) participated in the scheme.⁶

Note that the expected successful transformation may have increased permanent income and the lack of liquidity could have been minimized by the one-time gain from privatization. On the other hand, this transfer was of a windfall nature and should not have been consumed under the permanent income hypothesis. Hence, we tested whether the one-time transfer from privatization was cashed in and consumed and, if it was, at what size.

⁵ Restitutions meant transfers of property nationalised after 1948 to the original owners or their heirs. This "privatisation" method was limited to a narrow group of people but was worth approximately 100 billion CZK, i.e. one tenth of all privatised property.

⁶ There is a vast amount of literature describing Czech privatisation. See, for example, Mejstřík (1997) and Švejnar (1995).

III. The Data Set and Basic Findings

Analysis of consumption during the transition period is complicated by a number of concerns. The consumption data are inconsistent with the period between 1953-1989 because the statistical methodology completely changed when the statistical office started using Western standards to calculate national accounts. Furthermore, Czechoslovakia split into two independent countries in 1993, so it is quite clear that many types of data were not observed for the Czech Republic before 1993, or at least not in detail.

Another problem is that the paths of macroeconomic fundamentals as well as changes in the agents' behaviour are affected by abrupt shocks brought about by the transition. Taking into account the short time series, it is extremely difficult to recognize these shocks and distinguish their influence on the value and stability of coefficients. By and large, we must cope with the short time series where individual shocks and disturbances are hard to separate. As a result, it is impossible to separate the influence of various factors on consumption when using the data available from the Czech Statistical Office. As far as the privatization process and "voucher investments" are concerned, there are practically no data on the initial distribution and subsequent reallocation of the windfall. The only way to cope with all of these problems is to generate a sample survey.⁷

⁷ The data have been collected by the firm "Median" as part of a large survey entitled "OMNIBUS I/96". (Median belongs to the "big six" on the Czech market, and currently has the strongest position in media research, peplemeters, and special public opinion polls.) The original size of the data pool was 1500 individuals, the return rate was 85% and the final sample consisted of 1263 individuals (84% of the starting sample). Differences from the fully representative sample were negligible (a set of standard tests was done by "Median").

A number of serious problems were associated with designing the questionnaire for the survey. First, since the transfer of shares is not a classic windfall, it is necessary to observe the entire time period in order to find out what happened to both the transfer and the actual size of the windfall. Second, transferring shares also leads to missing values because it is sometimes difficult to quantify the size of the windfall.

There are three basic ways to resolve this problem:

- (I) We can apply a Heckman two-step procedure to minimize the bias in analysing the subsample with no missing values, which refers to approximately one half of the original sample in our case. This approach, however, leads to an inferior fit of the first probit equation (low R²). This means that the missing values (i.e. unknown windfall) are randomly distributed over the sample. We used this approach for comparison only, but it did not change our results.
- (II) Missing values can be treated as average values. This method is suitable for those individuals who reported that they had not spent the windfall and did not know its value. In this case, the windfall can be equalled to the average value and consumption equalled to zero. We have not applied this method because it would introduce a bias in favour of the PIH.
- (III) In the end, we chose the third option which is the analysis of sub-samples consisting of completely defined values. The bias introduced using this approach is against the PIH. This means that not rejecting the PIH under this setup leads to quite strong support of the PIH.

Another problem lies in the fact that the data are constructed *ex post facto*—reviewed after a two-year period—and we cannot rely on the precision of the numbers related to disposable income and personal consumption which could be obtained from such a questionnaire. Therefore, we decided not to construct the classic version of the consumption function. Instead, we estimate the consumption out of the windfall, which should give us more reliable results.⁸

⁸ The questions were what had been the actual amount (of the windfall) spent on non-durables and the period (month, year) when the purchase had been made (necessary for expressing it in real terms).

Finally, we took into account the different behaviour of various income groups. It is very likely that low income households would tend to spend a marginally larger part of their windfall than richer households. Hence, the population is grouped into four monthly income categories: up to 5000 CZK, 5001-8000 CZK, 8001-12500 CZK and 12501 CZK and above.⁹

The windfalls across these income groups are shown in Table 1:

Table 1: Windfall from Voucher Privatization (in ,000 CZK)

by income categories	Observations	Mean	Std. Dev.	Minimum	Maximum
1	255	15.555	12.76	.933	124.53
2	169	19.019	17.37	2.806	116.75
3	72	26.215	26.03	.964	121.62
4	43	32.840	61.53	5.637	411.37

An interesting byproduct of the sample survey is the fact that the average windfall rises with income. It can be argued that higher income (and better educated) groups allocated their vouchers better and/or sold their stakes at a better time.

A question associated with the size of the windfall is whether people cashed in the transfers of shares and whether this cash was used to purchase non-durables. A rule-of-thumb illustration is in Table 2. It can be seen from the table that only a small number of individuals used the windfall for consumption. This question is more thoroughly investigated in the following section.

⁹ The average exchange rate in 1995 was \$1=26.6 CZK.

Table 2: Handling of the shares from the 1st and 2nd waves of voucher privatization

Question	wave 1			wave 2		
	yes	no	miss.	yes	no	miss.
VP shares are an equivalent of a savings account	43	36	21	62	21	17
VP windfall used to buy non-durables	27	48	25	13	62	25
VP shares turned into another investment	10	63	27	4	70	26
VP shares transferred into a pension fund	0.3	71	29	0.4	73	27
VP shares given to family members	3	68	28	2	72	26

IV. Results

Unfortunately, we were not able to totally separate durable goods from consumption. Although we included a question on nondurable spending in the survey, it is very likely that respondents did not recognize the distinction between durables and nondurables. Therefore, consumption in our analysis covers a wider range of goods than the strictly nondurable concept requires.

We estimated standard models of the consumption function

$$\text{CONS} = \alpha + \beta \cdot \text{WINDF} \quad (1)$$

and

$$\text{CONS1} = \alpha + \beta \cdot \text{WINDF1} \quad (2)$$

where

$$\text{CONS1} = \text{CONS for all defined observations} \quad (3)$$

$$= 0 \text{ if CONS is missing}$$

and

$$\begin{aligned} \text{WINF1} &= \text{WINF for all defined values of WINDF} & (4) \\ &= \text{mean(WINDF) if WINDF is missing.} \end{aligned}$$

The results are presented in Table 3:

Table 3: Estimation results

by income categories	OLS results (1)		Tobit estimation (1)		Tobit estimation (2)	
	coefficient β (std. error)	R-square	coefficient β (std. error)	-Log of likelihood	coefficient β (std. error)	-Log of likelihood
1	.577 (.05)	.391	.589 (.06)	789.9	.234 (.11)	1027.0
2	.636 (.05)	.512	.655 (.06)	569.5	.657 (.11)	755.2
3	.317 (.07)	.210	.318 (.10)	233.9	.505 (.14)	279.0
4	.141 (.04)	.214	.147 (.05)	155.7	.272 (.04)	207.7
total	.317 (.02)	.271	.323 (.03)	1802.7	.328 (.05)	2286.8

Since we worked with truncated data (consumption out of the windfall can be equal to zero) for the robustness of our analysis, it is wise to estimate (1) using the tobit estimation. It is obvious that the marginal propensities to consume from the windfall are comparable with those obtained by the OLS estimation.

It is interesting that even model (2) — specific treatment of missing values — does not change the overall coefficient much. Nevertheless, we can observe a significant effect on the lowest income category — a substantial number of the respondents did not know the actual size of the windfall.

Both OLS and tobit estimations lead to the marginal propensity to consume from the windfall at a level slightly above 0.3. Undoubtedly, this coefficient is sufficiently small enough not to allow rejection of the PIH. Note also that the survey covers a three-year period so that the consumption of the windfall was spread over three years.

We find the analysis across income categories very useful. There is a clear tendency for the marginal propensity to decline with higher income (though the difference between groups 1 and 2 is negligible). It is in line with common sense that people in a low income group would spend a larger part of transitory income than those in higher ones. In our opinion, the aforementioned results for the total population as well as for individual income categories support the PIH.

V. Conclusions

Czech voucher privatization provides a unique opportunity to test the permanent income hypothesis as the state transferred a bulk of assets to households and created a windfall gain in this way. We tested whether these assets in the form of shares in companies or privatization funds were cashed in and spent or whether the windfall was kept and saved. The analysis showed that households consumed only a relatively small part of the windfall and the propensity to consume it does not enable us to reject the PIH. This result is also confirmed in a subsequent analysis across income categories.

The analysis, based on a sample survey, is subject to several biases, but these tend to support the PIH. First, we were not able to strictly distinguish consumption of durables and nondurables. We assume that consumption reported in the survey also (at least partially) contains durables which means that "our" consumption is higher than pure consumption. Second, the analysis was run on materialized transactions only. In other words, we only took into account solely those households that had in some way worked with the windfall. The question is how to interpret missing values. We are of the opinion that those who did not report any transactions using the property received from voucher privatization held this property so it can mostly be considered as their savings. We believe that this bias would also support the PIH rather than the opposite.

Another point is that the analysis covers a three-year period. This means that the assets acquired partly in the first wave of the period (the first wave of privatization) generated some revenues during this time as dividends and/or interest-type income. It can be argued that people first used this source of income for consumption before consuming the transferred shares.

Finally, voucher privatization coincided with a surge of new businesses and it is very likely that a part of the cash obtained from voucher privatization was also used for co-financing these activities. In the survey, it could easily have been reported as consumption while, in fact, it was a part of start-up costs.

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