Informal Food Production in the Enlarged European Union

Jens Alber · Ulrich Kohler

Abstract How widespread is the production of food in old and new member states of the European Union and what is the social meaning or logic of such activities? We show that growing food is (a) more widespread in former communist countries than in traditional market economies and (b) is predominantly a hobby or recreational activity in affluent countries, but a coping strategy in reaction to experienced difficulties in making ends meet in poorer nations, and especially so in the former communist countries.

1 Introduction

Comparative analyses of well-being are usually based on income as the key determinant of life chances in market economies. Comparisons based on income data produce misleading results, however, if large parts of economic transactions occur outside the market in the informal sector. It has frequently been pointed out that such informal forms of exchange were and continue to be particularly prominent in countries which were formerly under communist rule (Rose 1996). In these countries the market never became the predominant source of production or exchange to a similar degree as in western countries. Having experienced how the command economy frequently translated into a "shortage economy", where even the supply of food remained problematic (Kornai 1992), the citizens of these countries learned to cope with economic stress by relying on barter, informal assistance by family or friends, exchange in the shadow economy and also on the production of food. As Richard Rose and Yevgeniy Tikhomirov put it: "Where food supplies are uncertain and/or

J. Alber · U. Kohler (✉)
Inequality and Social Integration, Social Science Research Center (WZB), Reichpietschufer 50, Berlin, Germany
e-mail: kohler@wzb.eu

J. Alber
e-mail: alber@wzb.eu

market prices sometimes beyond the means of those whose wages have not risen to meet higher costs, a household's capacity to produce food outside officially recognised channels can be critical as a coping strategy" (Rose and Thikomirov 1993, p. 114). Presenting data for Russia and selected other post-communist countries, these authors showed that informal food production is practised widely not only by rural but also by urban households and that the proportion of people growing food in Central and Eastern Europe is much higher than the percentage of those employed in agriculture or living in rural areas.

From a comparative perspective such findings translate into the expectation that typical activities of the shadow economy such as informal food production are much more widespread in post-communist countries than in traditional market economies. However, a comparison of the sheer proportion of informal food production is misleading if one does not take into account the "social meaning" of informal food production. The driving force behind informal food production can be either dire need or individual preferences. While growing food would be a reaction to difficulties in making ends meet in the former case, it would be a hobby or recreational activity in the latter. Assuming that there is a plethora of hobbies which can serve as leisure activities, an impact on individual well-being in addition to market incomes can only be expected if food production is primarily a coping strategy serving the purpose of supplementing insufficient market power.

This article therefore focuses on two questions: *How widespread is the informal production of food in the member countries of the European Union, and to what extent is informal food production a coping strategy for making ends meet?*

We expect typical differences in the salience of informal food production as a coping strategy between rich and poor countries and between post-communist countries and traditional market economies. This expectation can be justified with supply side as well as demand side considerations. On the supply side citizens in the former command economies had come to cope with irregularities of supply by relying on informal economic activities, so that there is a stronger tradition of informal food production in post-communist countries. On the demand side, citizens of poorer countries are more likely to have difficulties purchasing foodstuff at market prices, especially if there is widespread unemployment. In more affluent countries even the poorest should be able to accommodate their demand for food within the market economy, whereas in less affluent countries, the poor might be more dependent on the shadow economy.

To test our hypothesis we proceed in three steps. In the next section, we describe the general research design of the analysis. The major objective of this section is to outline our strategy for disentangling the social meaning of informal food production, which is basically done by deriving testable implications from two adverse ideal types. We then go on to show that informal food production is more frequent in the post-communist European countries than in the other European countries (Sect. 3). Finally we analyse which of the implications derived in Sect. 2 hold true (Sect. 4). It will turn out that informal food production is a widespread coping strategy in the former communist countries but a recreational activity in the affluent countries of Western Europe. Poorer traditional market economies are in between these poles.

2 Data and Research Design

The guiding hypothesis of this article is that the importance of informal food production as a coping strategy differs between rich and poor countries and between post-communist countries and traditional market economies. To assess this hypothesis it is necessary to

observe the frequency of informal food production in rich and poor countries as well as in post-communist countries and in traditional market economies. In addition, however, it is necessary to show that the social meaning of informal food production is indeed that of a coping strategy. This section explains how we deal with these issues.

We use the European Quality of Life Survey (EQLS) to test our hypothesis. The EQLS was carried out in 2003 on behalf of the "European Foundation for the Improvement of Living and Working Conditions" in all EU member countries, and in Bulgaria, Romania and Turkey.[1] It contains information on 10 post-communist countries and on 18 traditional market economies. In addition, five of the traditional market economies—Malta, Cyprus, Greece, Turkey and Portugal—can be regarded as "poor" countries in the sense that they had a per capita gross domestic product below the average of the European Union at the time of the survey. All the post-communist countries must be regarded as poor in this sense. Hence, there is a sufficient number of countries for the comparison of informal food production between rich and poor countries, and between post-communist countries and traditional market economies.

The EQLS asked the question "In the past year, has your household helped meet its need for food by growing vegetables or fruits or keeping poultry of livestock?", to which the respondents could answer with "no, not at all", "yes, for up to one-tenth of the household's food needs", "yes, for between one-tenth and a half of household's food needs" or "yes, for half or more of the household's needs". We regard this as an indicator for informal food production, although this interpretation needs to be qualified for respondents who are professional farmers. Professional farmers definitely meet their need by growing food, however this can neither be seen as a hobby, nor as an activity of the shadow economy. We have therefore erased professional farmers from all analyses.[2] Hence, all results reported below refer only to the non-agrarian population of the European countries.

However, even after removing professional farmers from the analysis there is no direct information about *why* respondents engage in informal food production. It is therefore necessary to disentangle these driving forces in an indirect way. We do this by first deriving a set of observable implications from two ideal typical social meanings of informal food production, and then observing which of these implications are true.

Our test implications are as follows:

1.
    (a)   If informal food production is a coping strategy, it will be more widespread among poor people than among rich people.
    (b)   If informal food production is a recreational activity, it will be more or less equally distributed among social strata.[3]

These first two implications rest on the assumption that growing food as a coping strategy is forced by dire need, whereas hobbies are selected according to individual preferences. Although individual preferences might be socially structured to some degree,

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[1] The Data are available from http://www.esds.ac.uk/International/access/eurofound.asp. The samples cover the respective residential populations of age 18 and above. The sample size was approximately 1,000 observations in most countries, and around 600 in the smaller ones (Malta, Cyprus, Luxembourg, Slovenia and Estonia). Further information on the dataset can be found in Alber et al. (2004) and Kohler (2008).

[2] Respondents are treated as professional farmers if the current or last occupation of the main earner of the household was a farmer.

[3] At least if we assume leisure time and the time cost of various recreational activities to be evenly distributed.

there is no direct causal link from the socio-economic position to a preference for growing food. The correlation between income and informal food production should therefore be much larger if it follows a coping strategy logic than an individual preference logic.

2.
    (a)   If informal food production is a coping strategy, it will have a positive effect on subjective well being.

    (b)   If informal food production is a recreational activity, there will be no such relationship.

This implication rests on the assumption that as a coping strategy informal food production is a functional equivalent to income. It should therefore have similar effects as income itself. In other words, people who have an "additional income" from informal food production should be better off than those who do not. Clearly one would also expect that respondents will get a certain amount of satisfaction if they grow food as a hobby. In this case, however, people who don't grow food, are likely to engage in hobbies according to their own preferences. There is little reason to expect that growing food is more valuable than these other hobbies. Hence, we do not expect a higher subjective well-being of informal food producers if it is just a hobby.

3.
    (a)   If informal food production is a coping strategy, it will mitigate the effect of low income on subjective well-being.

    (b)   If informal food production is a recreational activity, there will be no such relationship.

This is a further implication of the idea that growing food is a functional equivalent of income. If growing food serves as an antidote against poverty, it should not only raise subjective well-being, but also cushion the effects of economic poverty. As in the case of implication 1 there is little or no reason to expect such an effect for growing food as a hobby.

3 The Prevalence of Informal Food Production in Europe

Our guiding hypothesis claims that informal food production is more frequent in poor countries than in more affluent countries, and particularly frequent in post-communist countries. Figure 1 presents the responses to the question about informal food production in two versions.[4] The left display shows the fractions of respondents who answered with yes, regardless of the intensity of their informal food production. The right display shows the fraction of respondents who produce more than 50% of their nutrition needs themselves. In both graphs horizontal spikes have been used to indicate the 95% confidence interval around the respective statistic.

The countries in the figure have been grouped into former communist countries and traditional market economies, with the latter additionally grouped into more affluent and poorer countries. The poorer countries are all countries with a GDP per capita below the European mean. We analyse the poorer traditional market economies separately because they are similar to the former communist countries regarding their economic development,
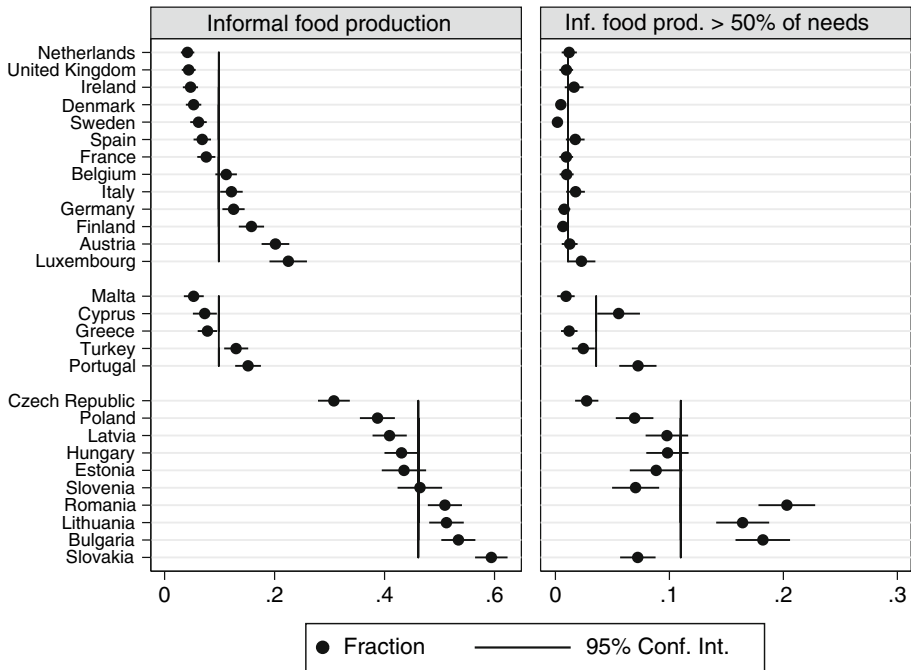

Fig. 1 Informal food production by country

while they share the long standing tradition of a market economy with the more affluent country group. The average proportion of informal food production in each of the three country groups is shown by a vertical line.

The figure indicates that informal food production is much more widespread in the former communist countries than it is in the traditional market economies. Over 50% of the respondents from the former communist countries produce at least some of their needs on their own, and still more than 10% produce over 50% of their needs by informal food production. In the traditional market economies, these percentages are only around 10 and 5% respectively. Even the two least affluent traditional market economies—Turkey and Greece—have much smaller proportions of informal food production than the transition countries. Only if one looks at the intensity of informal food production by focusing on those who produce more than 50% of their needs by this activity, do two of the poor market economies (Portugal and Cyprus) stand out as having a higher level of informal food production than the more affluent countries. However, even the proportions in these two countries are low by the standards of the post-communist countries.

On the whole, the main difference is between the former command economies and the long-standing market countries, while the degree of economic development seems to have little effect. Neither do poor market economies show a substantially higher proportion of informal food production than rich countries, nor are the poor traditional market economies similar to the likewise poor post-communist countries. In this sense, the results support the idea that informal food production is an effect of the supply side of the economy instead of the demand side. Seemingly, difficulties to purchase foodstuff at market prices alone do not necessarily bear informal food production. Instead irregularities of supply under the communist regime seem to have formed a habit of informal food production which persists until today.

The latter interpretations only hold if the social meaning of informal food production is that of a coping strategy. The next section examines to what extent this assumption holds true.

4 The Social Meaning of Informal Food Production

Our guiding hypothesis claims that the social meaning of informal food production is a coping strategy in post-communist and poor countries, while it is a recreational activity in the more affluent countries. In this section we will try to disentangle the social meaning of informal food production. We do this by testing the implications that were derived in Sect. 2.

4.1 The Social Distribution of Informal Food Production

Our first implication was that informal food production should be more widespread among poor people than among rich people if it were a coping strategy, whereas it should be more equally distributed among social strata if it were a recreational activity. On the assumption that economic development raises the incomes of all, including the poorest, one can further expect that the coping strategy is more widespread in poorer countries than in richer ones.

To test implication 1, we have set up logistic regression models of informal food production on income. "Informal food producers"—those on the left side of Fig. 1—are defined as all respondents who answered "yes" to the question about growing food. Income is measured by the position in country-specific quartiles of household equivalence income. The models have been calculated separately for the three country groups distinguished in Fig. 1. As the countries within each of the three country groups might differ in country specific characteristics that influence the conditions for agriculture (i.e. climate, access to arable land, accessibility to small-scale markets, etc.) we have used country dummies in all regression models. Therefore the regression coefficients cannot be biased due to arbitrary unobserved characteristics which are constant within each country.

Further, there is a need to control for individual characteristics that affect income *and* informal food production. Being unemployed or retired are the most obvious examples. Unemployment and retirement decrease individual income, yet increase the time for growing food. In other words: On average, poorer people have more time to spend on food production. Without controlling for employment status, the income effect is likely to include this time effect as well. As we are interested in the net effect of income on the likelihood of informal food production, we need to control for leisure time, and employment status is one broad indicator for it. A similar argument can be made for social class: Working class respondents typically have lower wages than white collar employers, but might be physically better prepared to perform the strenuous agrarian activities. Age, likewise, influences income as well as the physical condition and the likelihood of land ownership. The likelihood of land ownership will also be higher if the respondent lives in the open countryside, as opposed to a small town or a big city.[5] Finally being married

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[5] Community size was ascertained in the EQLS by a self-evaluation of the respondent. The results of this self-evaluation do not correlate well with marginals known from other sources. The correlation of country averages of the variable with the proportion of urban population reported by statistical offices is only $r = .23$. Nauenburg and Mertel (2004, p. 9) mention unrealistically low proportions of respondents living in the countryside in Bulgaria, Greece, Hungary, Rumania, and Turkey. Luxembourg and Belgium, on the other hand, show unrealistically low proportions of urban populations. All regression models were therefore also calculated without controlling for this particular variable. The substantive results remained unchanged.

offers the possibility of a division of labour in the production of the common goods for the household; while one partner is engaged in the formal labour market, the other one can engage in informal food production.

Summing up, we have included age (and age squared), a dummy variable for living in the open countryside, employment status, social class,[6] marital status and gender as control variables in the logistic regression model. However, although we stress the necessity of controlling for these individual characteristics in order to quantify the effect of income on informal food production, we are not interested in the effects of the control variables per se. We will therefore only document the coefficients in the tables without further interpretation.

The results of the regression models can be found in Table 1. Columns 1, 3 and 5 show the unstandardised regression coefficients of the logistic regression of informal food production on income without control variables, the other columns show the respective results controlling for individual characteristics. As already mentioned, all models were calculated with dummy variables for countries, but the coefficients were omitted from the table in order to save space.

Under the assumption that informal food production is a coping strategy we expect that it should be more widespread among poor than among rich people. According to the results shown in Table 1 a clear cut pattern of this sort is visible only for the post-communist countries, however. Here all household-income quartiles have a significantly lower probability of informal food production than the lowest income quartile. Moreover, the value of the coefficients increases with each step on the income scale, implying that the probability of informal food production consistently decreases with income.

For the rich and poor traditional market economies the results are less clear cut. Admittedly, the richest respondents are less likely to be informal food producers than the lowest income quartile, but the three other quartiles do not differ significantly from one another. Moreover, the group with the highest proportion of informal food producers is the second quartile instead of the first. Finally, the difference between the highest and lowest quartile is smaller in the traditional market economies than in the post-communist countries.

A formal significance test[7] shows that all the income coefficients of the post-communist countries differ significantly ($p < .05$) from those of the rich traditional market economies. The poor traditional market economies, on the other hand, do not differ significantly—neither from the rich market economies nor from the post-communist countries. Yet, the test values for the difference between rich and poor countries are much smaller than those for the difference between poor and post-communist countries.

To sum up our interim result concerning the social meaning of informal food production: On a continuum between recreational activity and coping strategy, the post-communist countries are more inclined towards the coping strategy pole, while the rich traditional market economies are more inclined towards the recreational activity pole. The poor market economies are in between the two other groups, but much closer to rich market economies than to the post-communist countries. The fact that the two groups of

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[6] Social class was built form the occupational status of the main earner in the household.

[7] Significance testing was done by a Chow test (Chow 1960), which is calculated by a "pool the data, interact, and test" procedure (Gould 2005). We have calculated a logistic regression model with data from all countries. The model included all the variables of the models in Table 1, together with any interaction terms between the variables and an indicator variable for country groups. This model fully reproduced the coefficients shown in Table 1 with the entire pooled data set. The significance test was then the Wald test of the interaction between income and the respective country group.

Table 1 Logistic regression models of informal food production

	Affluent market economies		Poor market economies		Former communist states	
	(1)	(2)	(3)	(4)	(5)	(6)
Income (reference: 1st within country quartile)						
2nd quartile	0.13	0.05	0.04	0.02	− 0.25**	− 0.20**
3rd quartile	− 0.01	− 0.04	− 0.14	− 0.11	− 0.42**	− 0.37**
4th quartile	− 0.35**	− 0.29*	− 0.51**	− 0.43*	− 0.78**	− 0.61**
Control variables						
Men		0.05		0.17		0.07
Open countryside		1.08**		1.72**		1.95**
Age		0.02**		0.02**		0.01**
Age (squared)		− 0.00**		− 0.00*		− 0.00**
Employment status (reference: employed)						
Homemaker		0.18		0.16		0.37**
Unemployed		0.01		0.27		0.11
Retired		0.28*		0.09		0.11
Other		0.88**		1.05**		0.42**
Class (reference: upper white collar)						
Lower white collar		0.29**		0.29		0.21**
Self employed		0.04		0.31		0.11
Skilled Worker		0.45**		0.62*		0.47**
Non skilled worker		0.30*		0.57		0.46**
Other		− 0.01		0.45		0.33*
Marital status (reference: married, living with partner)						
Separated/divorced		− 0.95**		− 1.10*		− 1.00**
Widowed		− 0.92**		− 0.99**		− 0.71**
Single, never married		− 0.58**		0.26		− 0.17*
Constant	− 1.35**	− 1.59**	− 2.80**	− 3.27**	0.16	0.01
McFadden r^2	0.05	0.11	0.03	0.10	0.03	0.09
n	9,070	9,070	2,811	2,811	7,768	7,768

Unstandardised regression coefficients (* $= p < 0.05$; ** $= p < 0.01$). Models include dummy variables for countries that are not documented in the table

long-established market economies are more similar to each other than the poor market economies are to the similarly poor post-communist countries sustains the idea that irregularities of supply under the communist regime have formed a habit of informal food production which persists until today.

4.2 The Influence of Subsistence Farming on Subjective Well-being

To the extent that informal food production helps people cope with economic hardship, it should also have a measurable effect on subjective well-being. Growing food as a hobby, on the other hand, should not increase subjective well-being much beyond that of other

respondents, because it is likely that many of them engage in hobbies according to their own preferences.

Measuring general life satisfaction on a 10 point scale from 1 to 10 where high values represent high levels of life satisfaction, the European Quality of Life Survey allows us to analyse the effect of informal food production on subjective well-being. Linear regression models are here used to quantify the effect of household food production on life satisfaction. Again we have calculated separate models for the rich and poor traditional market economies, and for the former communist countries. As before, we also included country dummies in order to control for the heterogeneity of countries within each country-group. Yet again it was necessary to control for a set of individual characteristics. The previous section has shown poor people to be most active in informal household production, especially in the post-communist countries. It is therefore likely that any positive effect of subsistence farming on subjective well-being is hidden by the negative effect of low market income. In order to distinguish between the effects of income and of informal food production per se, we have calculated the effects of informal farming with statistical controls for income. In addition we need to control for variables that are known to affect informal food production or subjective well being. We therefore added education to the set of control variables used in the models of the last section.

The results of the models are shown in Table 2. The net effects of informal food production on well-being among people with similar socio-economic background are presented in columns 2, 4 and 6 of Table 2. Two substantive findings stand out:[8]

- In the traditional market economies, informal food production has no significant effect on subjective well-being, regardless of how poor these countries are.
- In the post-communist new member states, in contrast, household food production clearly enhances people's general life satisfaction. The size of the effect is approximately as high as the effect of moving from the 2nd to the 3rd income quartile.

A formal significance test[9] show that the coefficient of informal food production is significantly ($t = 2.46$, $p = 0.014$) higher in the post-communist countries than in the rich market economies. The poor traditional market economies, on the other hand, do not differ significantly from those of the other two country groups. The test values for the comparison between rich and poor countries are, however, much smaller than those comparing poor and post-communist countries ($t = 0.04$ vs. $t = 1.61$).

The results once more fit the idea that the social meaning of informal food production varies. It is a recreational activity in rich traditional market economies but a coping strategy in the post-communist countries. At the same time the results yet again indicate that it is not so much the poverty of a country per se that promotes food production as a coping strategy, but rather the long-standing experience of a command economy which trained people to resort to informal resources outside official channels.

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[8] Both findings are replicated also if further characteristics like "sociability" (working for voluntary organisations, contacts with friends), or health (long term illness, health satisfaction) are included in the regression models.

[9] See footnote 7

Table 2 Linear regression models of life satisfaction on informal food production

	Affluent market economies		Poor market economies		Former communist states	
	(1)	(2)	(3)	(4)	(5)	(6)
Informal food producer	0.14*	0.07	− 0.01	0.07	0.06	0.28**
Control variables						
Men		− 0.12**		− 0.10		− 0.13*
Open countryside		− 0.01		0.26		− 0.01
Age		0.01**		− 0.01		− 0.01**
Age (squared)		0.00**		0.00**		0.00**
Income (reference: 1st within country quartile)						
2nd quartile		0.15**		0.38**		0.41**
3rd quartile		0.33**		0.92**		0.70**
4th quartile		0.46**		1.14**		1.11**
Employment status (reference: employed)						
Homemaker		− 0.09		0.09		− 0.01
Unemployed		− 0.83**		− 0.67**		− 0.78**
Retired		− 0.17**		0.33*		− 0.20*
Other		0.02		0.25		− 0.16
In education		0.41**		0.73*		0.60*
Education (reference: low)						
Intermediate		0.04		0.44**		0.09
High		0.09		0.60**		0.29**
Other		− 0.26*		− 0.23		0.01
Class (reference: upper white collar)						
Lower white collar		− 0.18**		− 0.41**		− 0.13
Self employed		− 0.22**		− 0.19		0.17
Skilled Worker		− 0.29**		− 0.39*		− 0.31**
Non skilled worker		− 0.47**		− 0.81**		− 0.67**
Other		− 0.40**		− 0.43		− 0.30*
Marital status (reference: married, living with partner)						
Separated/divorced		− 0.75**		− 0.66**		− 0.52**
Widowed		− 0.59**		− 0.60**		− 0.34**
Single, never married		− 0.51**		− 0.45**		− 0.33**
Constant	7.69**	7.86**	7.28**	6.58**	6.95**	6.28**
r^2	0.06	0.14	0.08	0.18	0.08	0.19
n	9,022	9,022	2,797	2,797	7,671	7,671

Unstandardised regression coefficients. Models include dummy variables for countries that are not documented in the table

4.3 Household Food Production as an Income Supplement or Substitute

Our third implication was that informal food production will mitigate the effects of income on subjective well-being if it is a coping strategy. If informal food production helps guarantee subsistence, having low income should be less problematic for those who grow

food than for those who do not. If, on the other side, informal food production were merely pursued as a hobby, there is no reason why its recreational function should systematically differ between rich and poor persons.

Statistically, the hypothesis can be tested by introducing an interaction term between income and informal food production into the models of the last section. The results of these models are shown in Table 3.

Looking first at the effect[10] of informal food production in the presence of interaction terms, the coefficients show the effect of household food production on well-being for persons in the lowest income quartile. If they engage in informal food production, poor people in former communist states are significantly more satisfied with their lives than if they abstain from growing food. For poor people in the affluent traditional market economies no similar positive effect is discernible. These results reiterate and confirm the findings of the previous section. A new, and somewhat surprising result concerns the poor traditional market economies. Here, poor persons who grow food have an even lower life satisfaction than poor people who do not grow food.[11]

The interaction terms lend themselves to two alternative interpretations. First, they allow us to compare the differential effect of informal food production in various income quartiles. Interpreted this way, they show that in the former command economies the effect of informal food production on subjective well-being is much bigger for the poorest than for the richest income quartile. While the effect is 0.44 for the lowest quartile (model 6), it is $0.44 - 0.58 = -0.14$ for the highest one. Similarly, for the poor market economies the negative effect of informal food production disappears if one looks at more affluent people (see Table 4). In other words: Household food production has little impact on subjective well-being among richer people regardless of where they live.[12]

The second interpretation of the interaction terms focuses on the difference of the income effect on life satisfaction between people who are or are not engaged in informal food production. Looking first at the income coefficients, we see that income has a positive effect on general life satisfaction, and that this positive effect is particularly strong in the post-communist countries, which reflects the diminishing marginal utility of income. This result reiterates the findings from many other studies in the field (Argyle 1999; Frey and Stutzer 2000, 2002; Di Tella et al. 2001; Graham and Pettinato 2001; Blanchflower and Oswald 2004; Delhey 2004; Böhnke 2005). In the presence of the interaction terms, however, this finding refers only to people who are not engaged in informal food production. In other words, income has a strong positive effect on life satisfaction for those without any household food production. The income effect is much weaker for people who resort to the informal production of food in post-communist countries. While the highest income quartile is around 1.37 points more satisfied with their lives than the poorest quartile this difference is much smaller for people engaged in informal farming, i.e. $1.37 - 0.58 = 0.79$. Obviously informal food production mitigates the adverse effects of low income and effectively helps people to "produce" or enhance subjective well-being in the post-communist countries.

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[10] We deliberately abstain from using the term "main effect" for the coefficients of the constituent variables of the interactions, because it is a misnomer. Showing the effect of the respective variable under the condition that the value of the other constituent variable of the interaction is zero, it would be better named a conditional effect. See Aiken and West (1991) for the interpretation of coefficients in regression models with interaction terms.

[11] The differences of the coefficients between the three countries groups are significant ($p < 0.05$). See footnote 7 for details of the significance test.

[12] Note that it does not really matter for this finding, whether one controls additional variables, or not.

Table 3 Linear regression models of life satisfaction on informal food production and interaction with income

	Affluent market economies		Poor market economies		Former communist states	
	(1)	(2)	(3)	(4)	(5)	(6)
Informal food producer	0.29*	0.13	− 0.61*	− 0.64*	0.45**	0.44**
2nd × sidel. farm.	− 0.09	− 0.07	1.05**	0.98**	− 0.10	− 0.04
3rd × sidel. farm.	− 0.16	− 0.06	0.91*	0.93*	− 0.16	− 0.08
4th × sidel. farm.	− 0.22	− 0.10	0.81	0.91*	− 0.68**	− 0.58**
Income (reference: 1st within country quartile)						
2nd quartile	0.29**	0.16**	0.41**	0.27*	0.65**	0.44**
3rd quartile	0.57**	0.34**	1.08**	0.81**	1.12**	0.76**
4th quartile	0.78**	0.47**	1.51**	1.04**	1.91**	1.37**
Control variables						
Men		− 0.12**		− 0.10		− 0.13**
Open countryside		− 0.01		0.26		− 0.02
Age		0.01**		− 0.01		− 0.01**
Age (squared)		0.00**		0.00**		0.00**
Employment status (reference: employed)						
Homemaker		− 0.09		0.09		− 0.01
Unemployed		− 0.83**		− 0.68**		− 0.77**
Retired		− 0.17**		0.32		− 0.20*
Other		0.03		0.31		− 0.15
In education		0.41**		0.68*		0.59*
Education (reference: low)						
Intermediate		0.04		0.44**		0.10
High		0.09		0.60**		0.29**
Other		− 0.26*		− 0.23		0.02
Class (reference: upper white collar)						
Lower white collar		− 0.18**		− 0.41**		− 0.13
Self employed		− 0.22**		− 0.21		0.18
Skilled Worker		− 0.29**		− 0.40*		− 0.31**
Non skilled worker		− 0.47**		− 0.81**		− 0.67**
Other		− 0.40**		− 0.44		− 0.30*
Marital status (reference: married, living with partner)						
Separated/divorced		− 0.75**		− 0.66**		− 0.51**
Widowed		− 0.59**		− 0.59**		− 0.33**
Single, never married		− 0.51**		− 0.45**		− 0.33**
Constant	7.27**	7.85**	6.48**	6.67**	5.93**	6.19**
r^2	0.09	0.14	0.14	0.18	0.15	0.19
n	9,022	9,022	2,797	2,797	7,671	7,671

Unstandardised regression coefficients. All models include dummy variables for countries that are not documented in the table

Table 4 Interpretation of interaction terms: Constituent effects plus interaction terms of models 2, 4 and 6	*Effects of informal food production*		
	For poorest income quartile	.13	− .64	.44
	For richest income quartile	.03	.27	− .14
	Effects of 4th vs. 1st income			
	For those not growing food	.47	.27	1.37
	For informal food producers	.37	1.95	0.79

There is no similar pattern in the affluent traditional market economies, where all interaction terms are insignificant. Finally, in the group of the poor traditional market economies the opposite holds true. Here, income has a larger effect for food growers than for those who do not grow food. There are two possible explanations for this unexpected result: The first is that informal food production starts only at much lower levels of income. The finding then reflects the economic struggle of the very poor to make ends meet by more or less failed ventures into the realm of informal food production. The second explanation is that being forced to grow food in an environment where it is uncommon is perceived as stigmatising.

However, despite the unexpected result for the poor market economies, the empirical results of our last implication once again underline the idea that informal food production has a different meaning in various parts of Europe. While it is pursued as a hobby with little influence on general life satisfaction in Western Europe, it serves vital welfare functions in the post-communist countries where it effectively buffers the adverse effects of low income.

5 Summary

We have shown that informal food production

- is more frequent in the former command economies of Central and Eastern Europe than in the traditional market economies of the West,
- is predominantly done by poor people in communist countries, while it is more uniformly done by all income groups in the affluent market economies,
- has a significant positive impact on subjective well-being in former command economies, but not in traditional market economies, and
- mitigates the effects of low income in the post-communist new member states but not in the affluent old member states of the European Union.

In conclusion, we find informal food production to be not only more widespread in the former command economies, but also to have a different social meaning. In the affluent traditional market economies people are generally not forced to produce their basic needs outside the market economy. If they do it anyway, it is more of a recreational activity, occasionally done by more or less all social strata, and with little consequences for subjective well being. In the former command economies of Central and Eastern Europe, informal food production has become a widespread and accepted means to guarantee subsistence that also serves important measurable welfare functions even up to the most recent present. Finally, our results suggest that even in poor market economies some of the

poor are constrained to engage in subsistence economy, but if they do so, they consider this as a harsh condition which even reduces their sense of well-being.

The finding has some important implications for social monitoring. First, it suggests that comparisons of the percentage of people living on low income do not give the full picture of material living conditions, as there are widely discrepant degrees of activity in informal sectors of the economy. Secondly, it may help to solve one of the frequently cited paradoxes in happiness research. Whereas cross-sectional studies usually show richer people or richer countries to have higher degrees of life satisfaction, longitudinal studies usually reveal that happiness and satisfaction do not grow in line with economic growth (Easterlin 1974, 1995, Hagerty and Veenhoven 2003; Easterlin 2005; Layard 2005). Traditional explanations of this paradox refer to adaption-effects and stress the importance of aspiration levels or of relative income in comparison to absolute income. Our findings suggest a potential alternative interpretation: To the degree that growth processes in the formal economy are linked to a shrinkage of the informal economy, monetary gains may be counteracted by a reduction in informal activities which we have shown to serve important functions for subjective well-being especially in countries with no or only short histories of a well-functioning market economy.

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