

Schneider, Friedrich; Bajada, Christopher

**Working Paper**

## The Size and Development of the Shadow Economies in the Asia-Pacific

Working Paper, No. 0301

**Provided in Cooperation with:**

Johannes Kepler University of Linz, Department of Economics

*Suggested Citation:* Schneider, Friedrich; Bajada, Christopher (2003) : The Size and Development of the Shadow Economies in the Asia-Pacific, Working Paper, No. 0301, Johannes Kepler University of Linz, Department of Economics, Linz

This Version is available at:

<https://hdl.handle.net/10419/73270>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

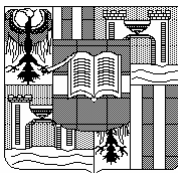
Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



**DEPARTMENT OF ECONOMICS**

**JOHANNES KEPLER UNIVERSITY LINZ**

---

**The Size and Development of the Shadow Economies in the  
Asia-Pacific**

Friedrich Schneider <sup>\*)</sup>  
Christopher Bajada

Working Paper No. 0301  
April 2003

---

**Johannes Kepler University Linz  
Department of Economics  
Altenberger Straße 69  
A-4040 Linz - Auhof, Austria  
[www.economics.uni-linz.ac.at](http://www.economics.uni-linz.ac.at)**

<sup>\*)</sup> Prof. Dr. DDr.h.c. Friedrich Schneider:  
[friedrich.schneider@jku.at](mailto:friedrich.schneider@jku.at)  
Tel. +43(0)732-2468-8210, -8209(Fax)

## 1. Introduction

As crime and shadow economy activities are a fact of life around the world, most societies attempt to limit these activities through various measures including punishment, prosecution and education. Gathering statistics on who is engaged in underground (or criminal) activities, the frequencies with which these activities are occurring and their magnitude, is crucial for making effective and efficient decisions regarding the allocations of a country's resources and for optimal public policy decisions. Unfortunately, it is very difficult to get precise information on these shadow (or underground) activities in terms of value added or labor market involvement, because all individuals engaged in these activities wish not to be identified.

Why are we interested in the shadow economy? Particularly in academia, applied economic research generally assumes a greater emphasis on the quantitative approaches to estimation and forecasting and little or no attention to the quality of the data used in the estimation process. To the casual observer the shadow economy has a number of important implications: (i) unreliable data affects the credibility of any statistical estimate attempting to model an economic phenomenon; (ii) it may give rise to inefficient policy prescriptions, particularly if it is driven by changes in published data; (iii) significant shadow economy activity deprives the government of much needed tax revenue to fund public works; and (iv) a large shadow economy promotes unfair price competition affecting those businesses who choose to voluntarily comply with their tax obligations.

In this paper we will provide the first known estimates of the shadow economy for eighteen (18) countries in the Asia-Pacific region over the last ten years. From these estimates we draw conclusions on how such activities have changed during this time. To do so we will use a well-known technique for estimating the shadow economy, often referred to as the currency-demand approach. We will test its robustness with an alternative and recently introduced methodology into this literature known as the Multiple Indicator – Multiple Cause approach or MIMIC for short. With these two independent means for estimating the shadow economy, our findings suggest that our estimates may sensibly reflect the 'true' extent of shadow economy activities in these countries. The conclusions that we draw are in line with expectations – that countries with relatively thin tax compliance initiatives experience greater

shadow economy activity when compared to those countries that are more actively involved in limiting such activities.

The remainder of this paper is organized as follows. Section 2 introduces a working definition of the shadow economy while Section 3 elaborates on the existing methodologies that have been used to estimate the shadow economy abroad. The two distinct approaches used to estimate the shadow economy for these eighteen Asian-Pacific countries are discussed in Sections 4 and 5. In Section 4 Australia is used as a case study to highlight how we go about estimating the shadow economy and examining the reliability of the estimates. In Section 5, using the same approach and methodology, the results for the remaining seventeen countries are reported and discussed. These estimates are then used to provide the first know (preliminary) measures of the size of the shadow economy labour force for these countries. In Section 6 we present our major conclusions.

## **2. Definition of the Shadow Economy**

The literature on the shadow economy lacks a coherent definition of the type of activities one might expect to find taking place in the shadow economy. Consequently academic's interpretation of what activities ought to be included has produced various estimates for any one particular country. Smith (1985, p.18) provides a very broad definition of the shadow economy as 'market based production of goods and services, whether legal or illegal, that escape detection in the official estimates of GDP'. However it is quite important to think about the definition of the shadow economy from two perspectives: (i) why might we be interested in obtaining estimates of the shadow economy in the first place; and (ii) how we might go about obtaining such estimates. If, for example, we are interested in obtaining estimates of the shadow economy to measure the extent of tax evasion or by how much the estimate of national output is underestimated, then we require a definition of shadow economy activities to be consistent with the national accounting convention. Consequently a commonly used working definition is that the shadow economy consists of unmeasured economic activity that has contributed to value added according to the national accounting convention but is not recorded because of the failure to report income in whole or in part. If, on the other hand, we have a specific methodology for obtaining estimates of these illicit activities, then this definition will need to be specifically focused on activities that will be

measured by this approach. For example, the use of a currency demand approach (*to be discussed below*) to estimate the shadow economy assumes that transactions in the shadow economy are settled in cash. Although this may be predominantly true, this methodology will not capture situations where the bartering of services is used as a means of exchange. Appropriately then we may refer to the estimate of these illicit activities using the currency demand approach as the *cash economy*, which principally is a sub-set of the broader definition intended by the term *shadow economy*.

As the conceptual framework and the objectives for measuring the shadow economy still leaves open a lot of questions, Table 1 may be helpful for developing a better gauge for what might be a reasonable consensus definition of the legal and illegal shadow economy activities.

**Table 1: A Taxonomy of Types of Underground Economic Activities<sup>a</sup>**

<b>Type of Activity</b>	<b>Monetary Transactions</b>		<b>Non Monetary Transactions</b>	
<b>ILLEGAL ACTIVITIES</b>	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud		Barter of drugs, stolen goods, smuggling etc. Produce or growing drugs for own use. Theft for own use.	
	<b>Tax Evasion</b>	<b>Tax Avoidance</b>	<b>Tax Evasion</b>	<b>Tax Avoidance</b>
<b>LEGAL ACTIVITIES</b>	Unreported income from self-employment; Wages, salaries and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighbour help

**Notes: (a)** Structure of the table is taken from Lippert and Walker (1997, p. 5) with additional remarks.

From Table 1 it is evident that the shadow economy may include unreported income from the production of legal goods and services either from monetary or barter transactions - hence all economic activities that would attract taxation and get reported as value added in the national accounts. Nevertheless a precise definition seems quite difficult, as “the shadow economy develops all the time according to the ‘principle of running water’: it adjusts to changes in

taxes, to sanctions from the tax authorities and to general moral attitudes, etc.” (Mogensen, et. al. 1995 p. 5).

In this paper we adopt a very specific definition of the shadow economy - consistent with (i) our objectives of estimating unobserved output and in-line with the national accounting convention and (ii) our methodology, which assumes that shadow economy activities are settled in cash. Essentially then we will present estimates of the cash economy rather than the shadow economy per se.

### **3. Methodologies Used to Estimate the Shadow Economy**

There appears to be a number of broad categories into which attempts to measure the shadow economy fall. Although each approach differs from application to application, the underlying conclusions from the majority of these studies (and this paper) are that the shadow economies worldwide have been growing over time. Our objective is to briefly review these methodologies and to discuss the advantages and disadvantages of each. To measure the size and development of the shadow economy three different approaches are most widely used. These are briefly discussed in the following three subsections.

#### ***3.1 Direct Approaches***

These are micro approaches that employ either well-designed surveys or samples and tax auditing or other similar compliance methods. Sample surveys designed to estimate active involvement in shadow economy activities have been widely used in a number of countries.<sup>1)</sup> The main disadvantage of these methods is that they are susceptible to a number of common problems: average precision and results that depend greatly on the respondents' willingness to co-operate and respond truthfully. It is therefore difficult to assess the growth of the undeclared work from such direct questionnaires. Most respondents surveyed hesitate to confess fraudulent behavior and quite often their responses are rarely reliable, making it difficult to calculate a reliable estimate (at least in monetary terms) of the extent of

---

<sup>1)</sup>The direct method of voluntary samples and surveys has been extensively applied to Norway by Isachsen, Klovland and Strom (1982); and Isachsen and Strom (1985). For Denmark this method was applied by Mogensen (et. al., 1995) in which they report 'estimates' of the shadow economy of 2.7 percent of GDP for 1989, 4.2 percent of GDP for 1991, 3.0 percent of GDP for 1993 and 3.1 percent of GDP for 1994.

undeclared legitimate activities. The main advantage however arises from the detailed information on the nature of the shadow economy activities that may be possible from direct questioning. However it should be noted, as one might expect, that the results from these surveys are very sensitive to the way in which the questionnaires are formulated<sup>2)</sup>.

Estimates of the shadow economy can also be based on the discrepancy between income declared for tax purposes and that measured by either random or targeted auditing initiatives. Fiscal auditing programs have been particularly effective in this regard. Designed to measure the amount of undeclared taxable income, they have been used to calculate the shadow economy in several countries.<sup>3)</sup> A number of difficulties beset this approach. Firstly, using tax compliance data is equivalent to using a (biased) sample of the population. Why? Since, in general, auditing compliance initiatives are not random but based on characteristics of filed tax returns, such a sample is not necessarily random and therefore is not representative of the whole population. This factor is likely to bias compliance-based estimates of the shadow economy. Secondly, estimates based on tax audits reflect that portion of shadow economy income that the authorities succeeded in discovering and this is likely to be only a fraction of total hidden income. Furthermore these audits are unlikely to detect activities that are paid for in cash. The auditing approach is better able to detect instances of overstating expenditures or concealing income earned from recorded transactions (such as interest earnings and dividend payments) than cash-based transactions. So, it is unlikely that surveys and tax auditing capture all shadow activities, and at best they can be seen as providing a lower bound estimate of the shadow economy. They are unable (at least at present) to provide estimates of the development and growth of the shadow economy over a longer period of time. As already argued, they have at least one considerable advantage - they can provide detailed information about shadow economy activities and the structure and composition of those who work in the shadow economy, but again this information may be very limited.

---

<sup>2)</sup> The reader should consult Mogensen et. al (1995) for a detailed treatment on the advantages and disadvantages of this approach.

<sup>3)</sup> For the United States see IRS (1979, 1983), Simon and Witte (1982), Witte (1987), Clotefelter (1983), and Feige (1986). For a more detailed discussion, see Dallago (1990) and Thomas (1992).

### ***3.2 Indirect Approaches***

These approaches, so called ‘indicator’ approaches, are mostly macroeconomic ones and use various economic and other indicators that contain information about the development of the shadow economy over time. Currently there are a number of indicators that have been proposed as providing ‘trails’ that one may use to track the size and growth of the shadow economy over time.<sup>4)</sup>

#### *3.2.a The Discrepancy between National Expenditure and Income Statistics*

This approach is based on discrepancies between national income and expenditure statistics as reported in the national accounts. In national accounting the income measure of GDP should theoretically be equal to the expenditure measure of GDP. Thus, if an independent estimate of the expenditure side of the national account is available, the gap between the expenditure measure and the income measure can be used as an indicator of the extent of the shadow economy.<sup>5)</sup> However, since national accounts statisticians will be anxious to minimize this discrepancy, the initial discrepancy or first estimate, rather than the published discrepancy should be employed for this purpose. If all the components of the expenditure side are measured without error, then this approach would indeed yield a good estimate of the scale of the shadow economy. However, unfortunately, this is not the case and the discrepancy, therefore, reflects all omissions and errors everywhere in the national accounts statistics as well as the shadow economy activity. These estimates should therefore be treated at best as very crude estimates of the shadow economy and of questionable reliability.<sup>6)</sup>

---

<sup>4)</sup> The less frequently used transactions and physical input approach have not been discussed here. The reader may wish to consult Schneider and Enste (2000) for a discussion on these.

<sup>5)</sup> See for example, Franz (1983) for Austria; MacAfee (1980) O’Higgins (1989) and Smith (1985), for Great Britain; Petersen (1982) and Del Boca (1981) for Germany; Park (1979) for the United States. For a survey and critical remarks, see Thomas (1992).

<sup>6)</sup> A related approach is pursued by Pissarides and Weber (1988). They use micro data from household budget surveys to estimate the extend of income understatement by the self-employed. This micro approach is susceptible to more or less the same difficulties arising from the national accounts statistics methodology just described.



### *3.2.b The Discrepancy between the Official and Actual Labor Force*

A decline in the participation rate for the official economy may be interpreted as an indication of increased activity in the shadow economy. If total labor force participation is assumed to be constant, a decreasing official participation rate can be seen as an indicator of an increase in the activities in the shadow economy, *ceteris paribus*.<sup>7)</sup> The weakness of this approach is that changes to the observed participation rate may be due to a number of factors other than the shadow economy. Moreover, people can work in the shadow economy and have a job in the ‘official’ economy, which *ceteris paribus*, would imply no change in the participation rate. Therefore estimates from such an approach should be viewed as weak indicators of the size and development of the shadow economy over time.

### *3.2.c The Currency Demand Approach*

The currency demand approach introduced by Cagan (1958) calculated a correlation between currency demand and the tax pressures (as one cause of the shadow economy) for the United States over the period 1919 to 1955. Some twenty years later, Gutmann (1977) used a similar approach, (without statistical methods) to estimate the shadow economy in the United States. He specifically looked at the ratio between currency and demand deposits over the years 1937 to 1976 as a basis for his inference about what had happened to the size of the US shadow economy overtime.

Tanzi (1980, 1983) extended on Cagan’s approach by estimating a currency demand equation for the United States for the period 1929 to 1980 as the basis for calculating the shadow economy. His approach assumed that shadow (or hidden) transactions are predominantly undertaken in the form of cash payments, because such activities leave no observable traces for the authorities to follow up and prosecute. An increase in the size of the shadow economy will therefore show up as an increase the demand for currency (more so now in light of growing currency substitutes). A number of causal factors, such as the direct and indirect tax burden, which are assumed to be the major factors causing people to work in the shadow

---

<sup>7)</sup> Such studies have been undertaken for Italy, see e.g., Contini (1981) and Del Boca (1981); for the United States see O’Neill (1983), for a survey and critical remarks, see Thomas (1992).

economy, were included in the estimation equation in addition to the usual variables namely, income and interest rates.<sup>8)</sup>

The increase in currency, that which is unexplained by the conventional or normal factors (interest rates, income, etc) is attributed to the factors motivating participation in the shadow economy (tax burden, etc). Estimates of the size of the shadow economy can be calculated in a first step by comparing the difference between the level of currency when the direct and indirect tax burden (and government regulations) are held at their lowest value, and the development of currency with the current (much higher) burden of taxation and government regulations. Assuming in a second step the same income velocity for currency in the shadow economy as in the legitimate economy, the size of the shadow can be computed and compared to the official measure of GDP.

The currency demand approach is one of the most commonly used approaches and has been applied to many OECD countries.<sup>9)</sup> As we will be adopting a modified version of this approach, which we think is more efficient, it is appropriate at this stage to note some of the common objections of the currency demand methodology.<sup>10)</sup> Although some of these criticisms may never be resolved, the alternative methodology (*to be discussed below*) that we will employ in Section 4 will demonstrate the relative robustness of the currency demand approach in estimating (in monetary terms) the size of the shadow economy. The most commonly raised objections to this method are as follows:

- (i) Not all transactions in the shadow economy are paid for in cash. For 1980, Isachsen and Strom (1985) used the survey method to find out that in Norway roughly 80 percent of all transactions in the hidden sector were paid in cash. The size of the total shadow economy (including barter) may thus be even larger than had been previously estimated.
- (ii) Most studies consider only one particular factor, the tax burden, as a cause of the shadow economy. Other factors (such as the impact of regulation, taxpayers' attitudes

---

<sup>8)</sup> The estimation of such a currency demand equation has been criticized by Thomas (1999) but part of this criticism has been considered by the work of Giles (1999a, 1999b) and Bhattacharyya (1999), who both use the latest econometric techniques. We adopt a similar approach in this paper.

<sup>9)</sup> See Schneider (1997, 1998), Johnson, Kaufmann and Zoido-Lobaton (1998a) and Williams and Windebank (1995).

<sup>10)</sup> See Thomas (1992, 1999), Feige (1986) and Pozo (1996).

toward the state, 'tax morality', etc) are not specifically considered because reliable data on these variables for most countries is not available. If, as seems likely, these other factors also have an impact on the extent of the hidden economy, estimates of the shadow economy that take these into account might produce estimates that are larger than those reported in most studies which have excluded them.<sup>11)</sup>

- (iii) The traditional currency demand model used for estimating the size of the shadow economy uses the ratio of currency to current deposits as a dependent variable. Garcia (1978), Park (1979), and Feige (1996) have pointed out that increases over time in the currency-demand deposit ratio (for the United States) was due largely to a slowdown in demand deposits rather than to an increase in currency caused by activities in the shadow economy.
- (iv) Blades (1982) and Feige (1986, 1996), criticize Tanzi (1983) on the grounds that the US dollar is used as an international currency and therefore its demand is affected by international factors not specifically accounted for in the model. Tanzi (1983) could possibly have considered (and controlled for) the US dollars that are used as an international currency and held in cash hoards abroad.<sup>12)</sup> Moreover, Frey and Pommerehne (1984) and Thomas (1986, 1992, 1999) claim that Tanzi's parameter estimates are not very stable.<sup>13)</sup>
- (v) Another weak point in the estimation is the assumption that the velocity of money is the same for legitimate and the shadow economy. Hill and Kabir (1996) for Canada, and Klovland (1984) for the Scandinavian countries, argue that there is already considerable uncertainty about the velocity of money in the official economy and with

---

<sup>11)</sup>One (weak) justification for the use of only the tax variable is that this variable has by far the strongest impact on the size of the shadow economy in the studies known to the authors. The only exception is the study by Frey and Weck-Hannemann (1984) where the variable 'tax immorality' has a quantitatively larger and statistically stronger influence than the direct tax share in the model approach. In the study of Pommerehne and Schneider (1985), for the U.S the tax variable dominated the other factors, which included regulation, tax immorality and minimum wages. The tax variable contributed roughly 60-70 percent of the size of the shadow economy. See also Zilberfarb (1986).

<sup>12)</sup> In another study, Tanzi (1982, esp. pp. 110-113) explicitly deals with this criticism. A very careful investigation of the amount of USD used abroad and US currency used in the shadow economy has been undertaken by Rogoff (1998). He concludes that large denomination bills play a significant role both in criminal and the shadow economy activities.

<sup>13)</sup> However in studies for European countries Kirchgassner (1983, 1984) and Schneider (1986) reach the conclusion that the estimation results for Germany, Denmark, Norway and Sweden are quite robust when using the currency demand method. Hill and Kabir (1996) find for Canada that the rise of the shadow economy varies with respect to the tax variable used; they conclude when the theoretically best tax rates are selected and a range of plausible velocity values is used, this method estimates underground economic growth between 1964 and 1995 at between 3 and 11 percent of GDP. "[Hill and Kabir (1996, p. 1553)].

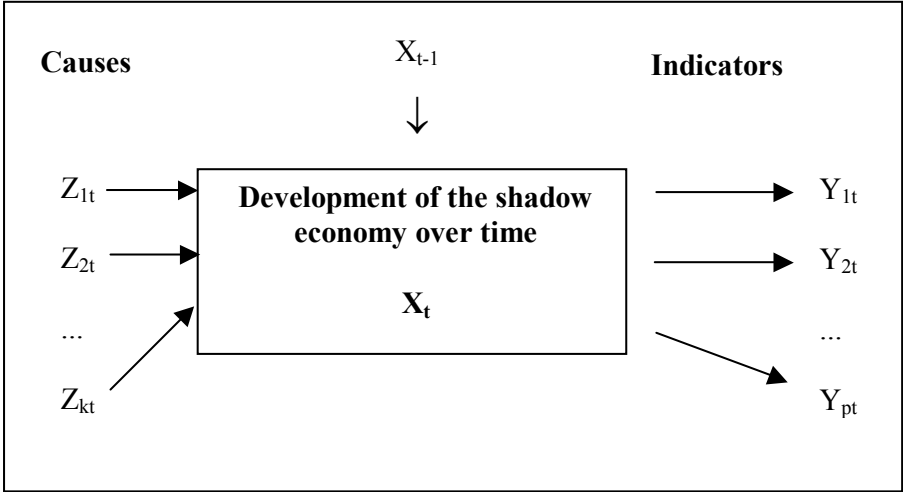
that said, the velocity of money in the hidden sector is even more difficult to estimate. Without prior knowledge of the velocity of currency in the shadow economy, one has to accept the assumption of ‘equal’ money velocity in the two sectors.

- (vi) Finally, the assumption of no shadow economy in a base year is open to criticism. Relaxing this assumption would again imply an upward adjustment of the figures attained in the bulk of the studies already undertaken. The approach used in Section 4 of this paper does not depend on this assumption.

### *3.3 A Model Approach*

The methodologies described so far were designed to estimate the size of the shadow economy through one indicator that is assumed to capture all effects of the shadow economy. However, it is obvious that its effects show up simultaneously in the production, labor, and money markets. An even more important critique is that the causes that motivate activity in the shadow economy are taken into account only in some of the monetary approach studies and even then only one or two of these causes are usually considered. The model approach explicitly considers multiple causes leading to the existence and growth of the shadow economy over time. The empirical method used is quite different from those used so far. It is based on the statistical theory of unobserved variables, which considers multiple causes and multiple indicators of the phenomenon to be measured. For the estimation, a factor-analytic approach is used to measure the hidden economy as an unobserved variable over time. The unknown coefficients are estimated in a set of structural equations within which the “unobserved” variable cannot be measured directly. The DYMIMIC (dynamic multiple-indicators multiple-causes) model consists in general of two parts, (i) the measurement model that links the unobserved (or latent) variables to observed indicators, and (ii) the structural equations model which specifies causal relationships among the unobserved variables. In this case, there is one unobserved (or latent) variable, the size of the shadow economy. It is assumed to be indirectly observable by a set of indicators of the shadow economy, thus capturing the structural dependence of the shadow economy on variables that may be useful in predicting its movement and size in the future. The interaction over time between the causes  $Z_{it}$  ( $i = 1, 2, \dots, k$ ), the size of the shadow economy  $X_t$ , and the indicators  $Y_{jt}$  ( $j = 1, 2, \dots, p$ ) is shown in Figure 1.

**Figure 1: Development of the shadow economy over time.**



There is a large body of literature<sup>14)</sup> on the possible causes and indicators of the shadow economy, in which the following three types of causes are distinguished:

**Causes**

- (i). The burden of direct and indirect taxation, both actual and perceived: a rising burden of taxation provides a strong incentive to work in the shadow economy.
- (ii). The burden of regulation as proxy for all other state activities: it is assumed that increases in the burden of regulation provides a strong incentive to enter the shadow economy.
- (iii). The ‘tax morality’ (citizens’ attitudes toward the state), describes the readiness of individuals (at least potentially) to leave their official occupations or engage after hours in shadow economy activities. It is assumed that a declining tax morality tends to increase the size of the shadow economy.<sup>15)</sup>

<sup>14)</sup>Thomas (1992); Schneider (1994a, 1997); Pozo (1996); Johnson, Kaufmann and Zoido-Lobaton (1998a, 1998b); and Giles (1999a, 1999b).

<sup>15)</sup> When applying this approach for European countries, Frey and Weck-Hannemann (1984) had difficulty obtaining reliable data for the regulation and tax morality variables. Hence, their study was criticized by Helberger and Knepel (1988), who argued that these results were unstable with respect to changing variables in the model over the years.

## Indicators

A change in the size of the shadow economy may be reflected in the following indicators:

- (i). Development of monetary indicators: if activities in the shadow economy increase, additional monetary transactions are required, particularly if cash is used to avoid detection.
- (ii). Development of the labor market: increasing participation of workers in the shadow economy may result in a decrease in participation in the official economy. Similarly, increased activities in the shadow economy may be reflected in shorter working hours in the official economy by those heavily engaged in such activities.<sup>16</sup>
- (iii). Development of the production market: an increase in the shadow economy means that inputs (especially labor) may move out of the official economy (at least partly), depressing the growth rate of officially measured output.

The latest use of the model approach has been undertaken by Giles (1999a, 1999b), Giles, Tedds and Gupsa (1999) and Giles and Tedds (2002). They estimate a comprehensive (dynamic) MIMIC model to get a time series index of shadow economy output for New Zealand and Canada, which they then estimate a separate “cash-demand model” to obtain a benchmark for converting this index into percentage units. Unlike earlier empirical studies of the shadow economy, they paid proper attention to the non-stationary, and possible co-integration of time series data in both models. Again this MIMIC model treats hidden output as a latent variable, and uses several (measurable) causal and indicator variables. The former include measures of the average and marginal tax rates, inflation, real income and the degree of regulation in the economy. The latter include changes in the (male) labor force participation rate and in the cash/money supply ratio. In their cash-demand equation they allow for different velocities of currency circulation in the hidden and recorded economies. Their cash-demand equation is not used as an input to determine the variation in the hidden economy over time – it is used only to obtain the long-run average value of hidden/measured output, so that the index for this ratio predicted by the MIMIC model can be used to calculate a level and the percentage units of the shadow economy over time. Giles latest combination

---

<sup>16</sup> It is possible that the participation rate as well as the number of hours worked may be unaffected by shadow economy activity if such activities are undertaken after hours or on weekends when individuals are not working in the legitimate economy.

of the currency demand and MIMIC approach clearly shows that some progress in the estimation technique of the shadow economy has been achieved and a number of critical points have been overcome.

#### **4. Case Study 1: Australia**

Among the many estimates of the shadow economy abroad, Bajada (2002) produced a time series estimate of the cash economy in Australia for the period 1968 to 2000. The estimates are based on an approach that assumes individuals are motivated to avoid the payment of taxes or prevent the loss of any government welfare assistance by expressly requesting cash when receiving payment so as to minimize their chances of being detected. For this reason Bajada (2002) argues that it makes good sense to approach the method of estimating the size of the underground economy by examining the money supply for clues to its size. Using a variant of the monetary approaches of Cagan (1958) and Tanzi (1983), Bajada estimates the size of the Australian cash economy to approximately 14.5% of GDP.

To produce an estimate of the cash economy for Australia we estimate a demand for money (currency) equation different from the traditional approach of estimating money demand (for example, using M1 as the dependent variable). We introduce additional regressors (tax burden, welfare payments, etc) to the standard income and interest rates explanation in order to satisfactorily explain holdings of currency, allowing for the possibility of a cash economy. The choice of functional form for the estimated equation was based on the Davidson-MacKinnon J-test for model selection and an Error Correction Model (ECM) was found to be the most preferred model specification.

The size of the underground economy is derived by measuring the excess sensitivity of taxes and welfare benefits on currency demand, that is whether changes in taxes and welfare benefits change real per capita currency holdings ( $C$ ) in addition to the effects on disposable income ( $YD$ ). The demand for currency is also driven by other explanatory variables, namely, (i) the interest rate ( $R$ ); (ii) the rate of inflation ( $\pi$ ) - rising rates of inflation, for example, erode the value of money and induce individuals to hold less of it; (iii) private consumption expenditure as a percentage of GDP ( $E$ ) - to capture currency demand arising as a result of

consumption expenditure (derived demand) in the legitimate economy by subterranean participants; and (iv) technological change ( $Tr$ ).

As currency is the principal means of exchange in the cash economy we can summarize this in the following specification of currency demand:

$$C = f(YD, R, \pi, E, Tr) \quad (1)$$

In this specification taxation ( $T$ ) and welfare benefits ( $Wf$ ) affect currency holdings through disposable income, which implies that (1) could alternatively be written as

$$C = f(Y - T + Wf, R, \pi, E, Tr) \quad (2)$$

It is however the excess sensitivity of  $T$  and  $Wf$  on currency that is important. Therefore we estimate currency demand using the following general specification

$$C = f(Y - T + Wf, T, Wf, R, \pi, E, Tr) \quad (3)$$

Currency in circulation in the absence of an underground economy (illegal currency) is found by subtracting these excess sensitive components. Multiplying the velocity of currency in the legitimate economy to the volume of illegal currency produces an estimate of the size of the cash economy. In Table 2 are the estimates of the ECM estimation. GSTD denotes a GST dummy variable to account for the introduction of the GST in 2000 while D2, D3 and D4 are seasonal dummies.



**Table 2: Estimation Results**

Dependent Variable: First Difference of (Natural) Logarithm of Real Currency per Capita (1967.2 to 2000.4)					
Variable	Coefficient	t-ratio	Variable	Coefficient	t-ratio
Constant	0.071	0.17	$\Delta(\pi)$	-0.012	2.79
Ln(T)	0.057	2.11	$\Delta\ln(W)$	-0.031	2.11
ln(R)	-0.007	1.42	$\Delta\ln(E)$	0.138	3.00
Ln( $\pi$ )	-0.010	3.23	Ln( $C_{t-1}$ )	-0.169	3.28
Ln(E)	-0.070	1.42	D2	-0.012	2.89
Ln(Y)	0.144	2.48	D3	-0.011	2.16
$\Delta\ln(Y)$	0.535	8.44	D4	-0.007	1.45
$\Delta\ln(T)$	0.157	4.69	GSTD	0.014	1.40
$\Delta\ln(R)$	-0.016	1.23			
Adjusted R <sup>2</sup> = 0.74			Durbin-Watson = 1.98		
Number of observations = 135			RESET(3) <sup>a</sup> = 4.66		
LM Statistic = 22.22			RESET(4) <sup>b</sup> = 3.08		
ARCH = 1.76					

Notes: (a) includes  $\Delta\ln(C_t)^2$  and (b) includes  $\Delta\ln(C_t)^2$  and  $\Delta\ln(C_t)^3$  as additional regressors.

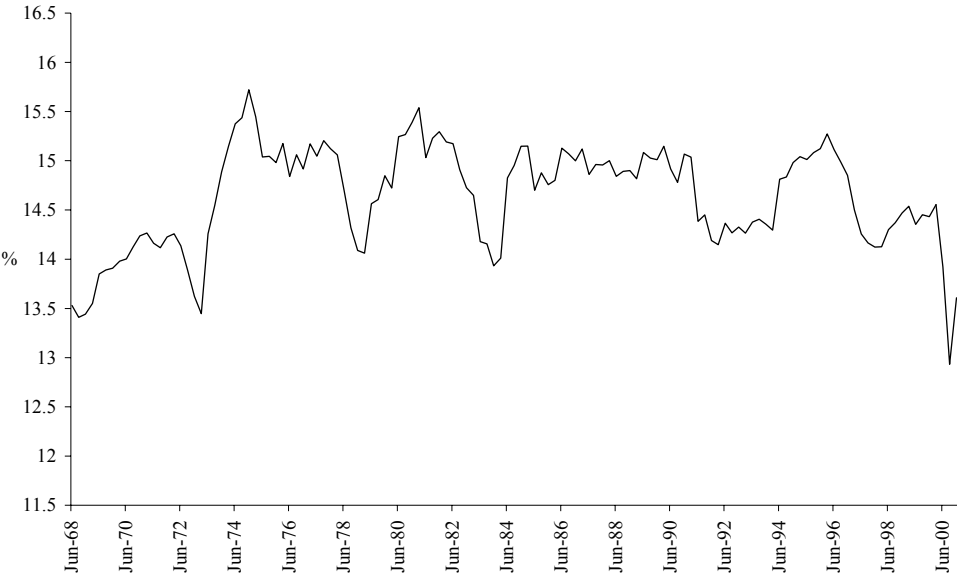
Most of the coefficients on the variables have the expected signs. The coefficient on interest rate is negative reflecting the opportunity cost on holding currency while the coefficient on disposable income is positive reflecting our expectations that for increases in economic growth there would arise a corresponding increase in the use of currency following increases in aggregate demand. The coefficient on the excess sensitivity of taxes is positive reflecting an incentive to conceal income from the tax authorities by demanding currency for the payments of goods and services. Interestingly the sign of the coefficient on welfare benefits is negative suggesting that those agents, who may be unemployed and receiving welfare benefits while working in the underground economy, trade-off work in the underground sector for more leisure when welfare benefits relative to their potential disposable income increases. The trend variable was found to be positive but insignificant and so it is not reported. It may be that such a variable is capturing both growing underground activities and technological development and producing a ‘net’ effect.

Most of the *t*-statistics are significant at the 1% level and the adjusted R<sup>2</sup> is 0.74. The Ramsey (1969) RESET test shows no indication of mis-specification at the 1% level. Furthermore this specification for currency demand does not exhibit autocorrelated (Durbin and Watson, 1951) or heteroscedastic (ARCH) (Engle, 1982) disturbances. The calculated  $\tau$  statistics for the Augmented Dickey-Fuller (ADF) equation (not shown here) to test the existence of a unit

root in the residuals are larger in absolute terms than the critical values. On the basis of such evidence we may infer that the regression equation is cointegrated. From these results we plot the cash economy in Australia for the period 1968 to 2000 in Figure 2.

There are three stylized facts of the cash economy evident from Figure 2. First, the cash economy exhibits cyclical behaviour, which appears to coincide with the cyclical behaviour of the legitimate economy. Second, the cash economy in Australia has been relatively stable as a percentage of GDP, although there is some evidence of a mild decline at least during this period. This is not the case however for the period prior to 1978. Since 1978 the cash economy has averaged just shy of 15% of GDP. Third, in the lead up to the GST (in July 2000), the cash economy declined and the extent of this decline has by far exceeded any decline in the cash economy that has occurred during an economic downturn. This may be due to a number of factors including the impact of the tax mix and timing of consumption around the time of the introduction of the GST.

**Figure 2 – The Cash Economy in Australia**

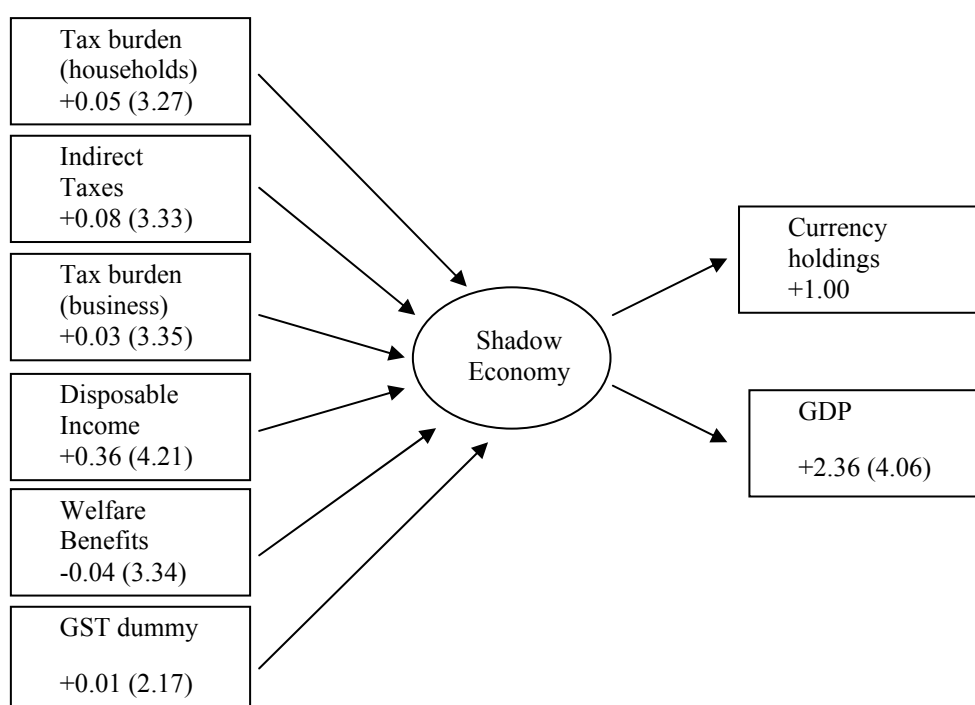


In the remainder of this section we attempt to test the robustness of this result by using an alternative methodology that estimates a single latent variable from a number of causal and indicator variables (MIMIC – see Section 3). The latent variable is a hypothetical construct

that is not directly observable but it is known that the causal variables determine the size of the latent variable, which in turn has operational implications for the indicator variables. In using this methodology to examine the results presented in Figure 2, we will produce an index rather than an absolute measure of the variable in question. Typically the currency demand approach would be used to provide a benchmark estimate from which an absolute time series measure of the shadow economy may be constructed from this MIMIC index. In this paper we will adopt this approach and compare the results. We will also briefly look at the business cycle characteristics from Figure 2 with those estimated using the MIMIC approach.

The causal indicators that we have used in this MIMIC estimation include a measure of the tax burden (both the average direct and indirect tax rate), the proportion of welfare benefits to disposable income, and real disposable income per capita (to account for the incentives to participate in the cash economy from changes to take-home-pay). As this includes an implicit account for taxes, we expect this variable to outweigh the effects of taxes as separate variables in the model. Our results confirm this expectation. We have not included a measure of regulatory intensity here because such a variable is not readily available. If one was to include a reliable measure of such variable, we might expect the estimates of the cash economy to be much larger than those reported from either the currency demand or the MIMIC approach. The indicator variables include real currency per capita in circulation (since much of the shadow economy activities are settled in cash) and real gross domestic product per capita (as one may expect to find a correlation between the business cycles of the shadow and legitimate economies). The results from the (dynamic) MIMIC model estimation are presented graphically in Figure 3. The t-statistics are reported in parenthesis and the coefficient on currency holdings is constrained to +1.00 in order to identify the system and make the parameter estimates more easily comparable to one another.

**Figure 3 - MIMIC Modeling Results**

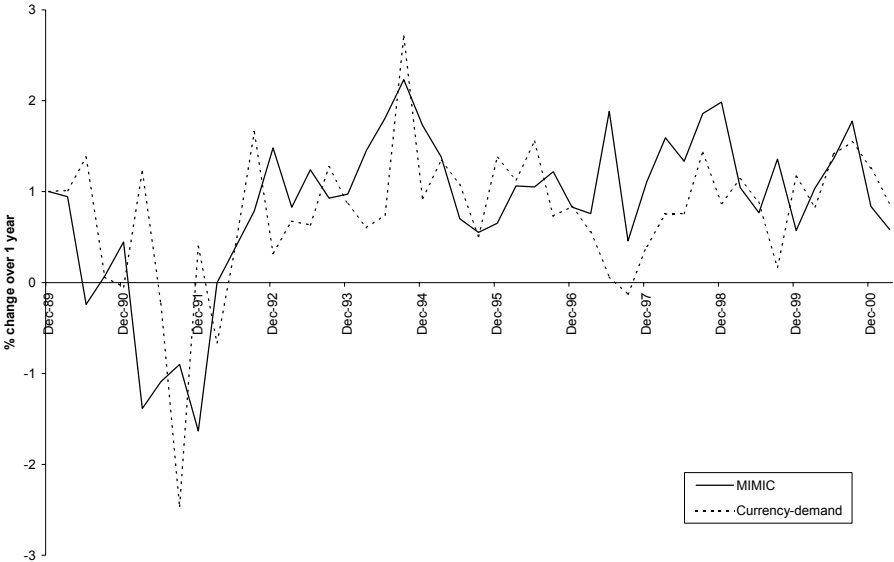


As with the currency demand approach, the data used in the MIMIC estimation was difference after testing for the presence of a unit root in the data and again we paid special attention to the possibility of co-integration of the time series data. Once estimated we examined the statistical significance of the model using various goodness of fit measures and the Q-plot of the standardized residuals, the standard techniques used in MIMIC modeling. The non-central  $\chi^2$  statistic ( $\chi^2=3.80$ ;  $p$ -value=0.58) is a test for the fit of the structural model. As the  $\chi^2$  statistic tests the MIMIC against the alternative that the covariance matrix of the observed variables is unconstrained, a large  $p$ -value represents an acceptance of this null hypothesis. The  $p$ -value suggests a good fit for the structural model. The parameter estimates have the expected signs and each estimate is significant at the 5% level.<sup>17</sup> Consistent with our expectations, each tax variable is positively related to shadow economy activity and interestingly, the model suggests that indirect taxes play a major role in influencing the extent of illicit activity in Australia.

<sup>17</sup> For reasons already discussed, the parameter estimate for welfare benefits relative to disposable income is negative and consistent with the sign from currency demand approach.

With the parameter estimates on the causal variables it was then possible to construct an index of the growth rate of the shadow economy for Australia. A similar growth rate index was constructed from the currency demand estimate of the shadow economy reported in Figure 2, and both of these are plotted in Figure 4. It appears from this figure that there is a great deal of similarity in the general cycles produced by each model and so providing one positive cross-check that the estimates arrived at by the currency demand approach are robust when compared with the results from this independent estimation technique.

**Figure 4 – Comparing the MIMIC and Currency demand Model Results – Annual Growth Rates**



A second cross-check is from a comparison of the level estimates of the shadow economy. Using the currency demand approach to benchmark the starting values of the shadow economy, the MIMIC index was used to generate the level path (as a % of GDP) for the shadow economy. The results are quite comparable and the differences between the two estimates are presented in Table 2 that follows.

**Table 2: Comparing Estimates (% of GDP) – Currency Demand versus MIMIC**

	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
<b>(A) Curr-Dmd</b>	14.90	14.57	14.37	14.49	14.92	15.19
<b>(B) MIMIC</b>	14.63	13.40	14.72	14.77	15.76	15.05
<b>(A-B) Diff</b>	0.27	1.17	-0.35	-0.28	-0.85	0.14
	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>Average</b>
<b>(A) Curr-Dmd</b>	15.09	14.25	14.45	14.54	13.81	<b>14.60</b>
<b>(B) MIMIC</b>	15.21	15.27	15.46	14.79	13.98	<b>14.82</b>
<b>(A-B) Diff</b>	-0.12	-1.02	-1.01	-0.24	-0.16	<b>-0.22</b>

The currency-demand approach produced smaller estimates of the shadow economy for 8 of the 11 yearly estimates presented in Table 2. However the estimates from both the currency-demand and the MIMIC approach are remarkably similar, only 0.22% of GDP separates them on average.

In the following section we employ the two methodologies to estimate the size of the remaining Asian-Pacific nations in our sample. We follow this up by a discussion of these results.

## **5. Case Study 2: The Asia-Pacific Region**

Quite often for individual countries and on occasions for a select and small groups of countries (e.g. selected OECD or transition countries), research has been undertaken to estimate the size of the shadow economy and its labor force using a variety of approaches. In what follows is an attempt to estimate the size (in terms of GDP) and labour force of the shadow economy for eighteen Asia-Pacific nations since 1989/90. This is the first known attempt to estimate the size of the shadow economy and its labor force using a standardized estimation technique that will allow for a direct comparison between the countries in question.

To estimate the size of the shadow economy for these countries we employ the currency demand and the MIMIC approach as described in the previous section. The results are presented in columns 2 to 4 of Table 3. If one first starts with the latest results (2000-01), the largest shadow economy estimate is for Thailand, with 51.9% of official GDP being the equivalent measure of shadow economy in that country. This is followed by Sri Lanka

(43.7% of GDP) and the Philippines (42.6% of GDP). The next class of estimates includes India (22.8% of GDP), Israel (21.9% of GDP) and Taiwan (19.6% of GDP). At the lower end of the scale is China (13.4% of GDP)<sup>18)</sup>, New Zealand (12.9% of GDP) and Japan (11.3% of GDP). If we turn to the development of the shadow economies for these eighteen countries since 1989/90, we see that the shadow economy on average climbed from 20.9% of GDP to 22.9% of GDP by 1994-95 and then to 26.1% by 2000-01. On average the shadow economy for these eighteen countries increased by 5.2% of official GDP. The effect is even more significant for the less developed countries: Bangladesh with a shadow economy of 26.2% during 1989-90 climbed to 34.9% by 2000-01; Thailand with a shadow economy measuring 44.2% in 1989-90 climbed to 51.9% by 2000-01. We might expect this result because these countries have relatively poor monitoring and compliance instruments that can be used to limit the growth of these clandestine activities.

---

<sup>18)</sup> The calculation of the shadow economy for China is very difficult and the values may be questioned because only a part of China has so far been developed into a market economy. A great part of China may still be classified as a planned economy and due to this mix of systems the calculated figures may be not very reliable.

**Table 3: The Size of the Shadow Economy and of the Shadow Economy Labor Force of 18 Asia-Pacific Countries**

Country	Size of the Shadow Economy (in % of “official”GDP)			Shadow Economy Labor Force (Average 1998/99)		
	Average 1989/90	Average 1994/95	Average 2000/2001	Persons (millions)	in % of “official” Labor Force	in % of Population
1 Australia	15.0	15.0	14.3*	1.1	11	5.8
2 Bangladesh	26.2	30.2	34.9	17.72	27.7	14.1
3 China	-	10.2	13.4	152.43	20.5	12.3
4 Hong Kong	13.0	15.3	16.5	0.46	13.2	8.1
5 India	18.1	20.3	22.8	117.23	27.2	11.9
6 Indonesia	10.4	15.4	18.9	30.74	31.3	15.1
7 Israel	14.3	17.1	21.9	0.51	16.7	8.2
8 Japan	8.8	10.6	11.3	4.76	7.1	3.8
9 Korea (South)	19.4	22.4	26.7	4.51	19.6	9.7
10 Malaysia	26.4	28.3	30.9	2.25	25.1	10.1
11 Nepal	32.6	33.4	37.4	3.34	30.4	14.4
12 New Zealand	9.2	11.3	12.9	0.18	9.2	4.7
13 Pakistan	28.2	31.4	35.9	15.23	31.0	11.6
14 Philippines	34.2	38.4	42.6	9.82	30.6	13.0
15 Singapore	9.4	11.2	13.7	0.21	10.2	6.3
16 Sri Lanka	30.4	35.3	43.7	2.54	31.3	13.3
17 Taiwan	15.3	17.4	19.6	1.95	14.5	8.7
18 Thailand	44.2	48.3	51.9	14.83	40.0	20.1
<b>(Unweighted) Average of the 18 Countries</b>	<b>20.9</b>	<b>22.9</b>	<b>26.1</b>	<b>21.14</b>	<b>22.0</b>	<b>10.6</b>

Notes: (\*) 1999/00 estimate



Having examined the size of the shadow economy in terms of value added, we now turn our attention to the size of the shadow economy labour force. By definition every activity in the shadow economy involves a “shadow” labor market. The ‘shadow labor market’ includes all cases where the employees and/or employers occupy a ‘shadow economy position’ from which they earn an income and is concealed from the authorities. Why do people work in the shadow economy? In the official labour market, the cost to firms when having to ‘legitimately’ employ someone are increased tremendously by the burden of tax and social contributions on wages, as well as by the legal and administrative regulation that the firm is expected to comply with.<sup>19)</sup> For some OECD countries, these costs may exceed the wage effectively paid to the worker – providing a strong incentive to participate in the shadow economy. Lemieux, Fortin, and Fréchet (1994), using micro data from a survey conducted in Quebec City (Canada), provide a framework of the labor supply decision by workers participating in the shadow economy. In particular, their study provides some insight into the size of the distortion caused by income taxation and the welfare system. The results of this study suggest that hours worked in the shadow economy are quite responsive to changes in the net wage in the regular (official) sector. Their empirical results attribute this to a misallocation of work from the official to the informal sector, where it is not taxed. In this case, the substitution between labor-market activities in the two sectors is quite high. These empirical findings clearly indicate, “participation rates and hours worked in the underground sector also tend to be inversely related to the number of hours worked in the regular sector” (Lemieux, Fortin, and Fréchet 1994 p. 235). These findings also demonstrate that (i) there is a large negative elasticity of hours worked in the shadow economy with respect both to the wage rate in the regular sector, and (ii) there is a high degree of mobility between the two sectors, giving the impression of a very dynamic shadow economy.

Illicit work can take many forms, for example, a second job either during or after regular working hours, work by individuals who do not participate in the official labor market and clandestine or illegal immigrants who actively engage in the shadow economy to prevent detection and deportation. Empirical research on the shadow economy labour market is even more difficult than estimating the aggregate size of the shadow economy particularly because

---

<sup>19)</sup>This is especially true in Europe (e.g. in Germany and Austria), where the total tax and social security burden adds up to 100% on top of the wage effectively earned.

one has very little knowledge about how many hours on average a shadow economy worker is actually working.<sup>20)</sup>

The following results of portraying the shadow economy labor force are based on the Worldbank database on informal employment in major cities all over the world (see footnote 20). Columns 5 to 7 of Table 3 provide the estimates of shadow economy labour market for these eighteen Asia-Pacific nations.<sup>21)</sup> The values of the shadow economy labor force are calculated in absolute terms and in percent of the official labor force, under the assumption that in rural areas the shadow economy is at least as high as in the cities. This is a conservative assumption, as in reality the shadow economy will most likely be even larger in rural areas.<sup>22)</sup> The following results are preliminary and should be treated as a first attempt to calculate the shadow economy labor force for these countries.

If we consider the size of the shadow economy labor force as a percentage of the “official” labor force, we see once again that Thailand (for the year 1989/90) has by far the biggest shadow economy labor force (40% of the official labour force), followed by Indonesia (31.3%) and Sri Lanka (31.3%). In the middle field are Malaysia with 25.1%, China with 20.5% and Korea (South) with 19.6%. At the lower end is Singapore with 10.2%, New Zealand with 9.2%, and Japan with 7.1% of the “official” labor force. From these results one may conclude that the shadow economy labor force has reached quite a considerable size. If we consider these figures in absolute terms (millions of people) the larger nations have the biggest shadow economy labor force. For example, China has 152.4m ‘full-time shadow economy workers’, followed by India with 117.2m and by Indonesia with 30.7m.<sup>23)</sup>

---

<sup>20)</sup>For developing countries some literature about the shadow labour market exists, e.g. the latest works by Dallago (1990), Pozo (1996), Loayza (1996), especially Chickering and Salahdine (1991).

<sup>21)</sup> There is a particularly strong relationship and “social networking” that takes place between those people who are active in the shadow economy, as one would expect to find in the official labor market. Pioneering work in this area has been done by L. Frey (1972, 1975, 1978, 1980), Cappiello (1986), Lubell (1991), Pozo (1996), Bartlett (1998) and Tanzi (1999).

<sup>22)</sup> The assumption that the shadow economy labor force in the cities is at least as large as in the rural areas, is a very modest one (see Lubell (1991) and Bartlett (1998)). Lubell (1991), Pozo (1996) and Chickering and Slahdine (1991) argue that the shadow economy labor force is up to twice as high in rural area compared to the major cities. But as there exists no (precise) figures on this ratio, the assumption of equal size may be justified and at best provides a lower bound estimate.

<sup>23)</sup> It should be clearly emphasized, that the following values have been calculated under the extreme assumption, that a “full-time shadow economy worker” is as productive as his colleague in the official economy. If this were not the case, these figures would increase. Moreover the assumption of a full time shadow economy worker is extreme. Most people working in the shadow economy have an ‘official’ job, as well so that the figures on ‘full time shadow economy workers’ is an artifact – it is a construction of the number of ‘job’ supporting shadow economy activities.

## **6. Conclusion**

The existence of a shadow economy affects the quality of national accounts data as well as fiscal data reported in government budgetary papers. Not only does individual and business participation in the shadow economy contribute to lower tax revenue, it also affects the quality of economic and social information which policymakers use to gauge their economic policies. The fact that the size of the shadow economies in each of the eighteen Asia-Pacific nations that we have estimated in this paper have grown considerably since 1989/90, suggests that national accounts data is on average significantly underestimated. The results appear more so for those countries that have inefficient means of detecting and discouraging shadow economy activities. Immediately this casts doubts on the quality of data on economic growth, inflation, the size of the business cycle, the rate of unemployment, the volume of savings and the level of productivity in the economy in each of these countries. The doubts are greater of course for those less developed countries. From such data distortions only poor policy prescriptions can follow.

Nevertheless, in an age when there has been a growth in government regulation and scrutiny of the tax collection system, international evidence, particularly that presented in this paper, suggests quite clearly that the size of these shadow economic activities is growing world wide. It is important then that governments should take seriously the issue relating to the shadow economy by considering the rules, regulation, taxes and welfare benefits which may have sparked the enthusiasm to participate in these activities and to actively pursue policies to combat these areas of growing noncompliance.

## References

- Aigner, Dennis; Schneider, Friedrich and Damayanti Ghosh (1988): Me and my shadow: estimating the size of the US hidden economy from time series data, in W. A. Barnett; E. R. Berndt and H. White (eds.): *Dynamic econometric modeling*, Cambridge (Mass.): Cambridge University Press, pp. 224-243.
- Bajada, C. (2002) *Australia's Cash Economy: A Troubling Issue for Policymakers*, Ashgate, UK.
- Bartlett, Bruce (1998): Corruption, the underground economy, and taxation. Washington D.C.: National Center for Policy Analysis, *unpublished manuscript*.
- Bhattacharyya, D.K. (1999): On the Economic Rationale of Estimating the Hidden Economy, *The Economic Journal* 109/456, pp. 348-359.
- Blades, Derek (1982): "The Hidden Economy and the National Accounts", *OECD (Occasional Studies)*, Paris, pp. 28-44.
- Cagan, Phillip (1958): "The Demand for Currency Relative to the Total Money Supply," *Journal of Political Economy*, 66:3, pp. 302-328.
- Cappiello, M.A: (1986): "Proposita di bibliografia ragionata sull'economia sommersa nell'industria (Italia 1970-82)", pp. 307-345, in: Bagnasco, A. (ed.): *L'altra metà dell'economia. La ricerca internazionale sull'economia informale*, Liguori, Naples.
- Chickering, Lawrence A. and Muhamed Salahdine (eds.) (1991): *The silent revolution-The informal sector in five Asian and near Eastern countries*, San Francisco: An International Center for Economic Growth Publication (ICS Press).
- Clotefelter, Charles T. (1983): Tax evasion and tax rates: An analysis of individual return, *Review of Economic Statistics*, 65/3, pp. 363-373.
- Contini, Bruno (1981): Labor market segmentation and the development of the parallel economy – the Italian experience, *Oxford Economic Papers*, 33/4, pp. 401-12.
- Dallago, Bruno (1990): *The irregular economy: The "underground economy" and the "black labor market"*, Dartmouth (U.K.), Publishing Company.
- Del Boca, Daniela. (1981): Parallel economy and allocation of time, *Micros (Quarterly Journal of Microeconomics)*, 4/2, pp. 13-18.
- Feige, Edgar L. (1986): A re-examination of the "Underground Economy" in the United States. *IMF Staff Papers*, 33/ 4, pp. 768-781.
- Feige, Edgar L. (1989) (ed.): *The underground economies. Tax evasion and information distortion*. Cambridge, New York, Melbourne, Cambridge University Press.
- Feige, Edgar L. (1994): The underground economy and the currency enigma, *Supplement to Public Finance/ Finances Publiques*, 49, pp. 119-136.
- Feige, Edgar L. (1996): Overseas holdings of U.S. currency and the underground economy, in: Pozo, Susan (ed.): *Exploring the Underground Economy*. Kalamazoo, Michigan, pp. 5-62.

- Franz, A. (1983): Wie groß ist die "schwarze" Wirtschaft?, *Mitteilungsblatt der Österreichischen Statistischen Gesellschaft*, 49/1, pp. 1-6.
- Frey, Bruno S. and Hannelore Weck (1983a): "Bureaucracy and the Shadow Economy: A Macro-Approach", in Horst Hanusch (ed.): *Anatomy of Government Deficiencies*. Berlin: Springer, pp. 89-109.
- Frey, Bruno S. and Hannelore Weck (1983b): "Estimating the Shadow Economy: A 'Naive' Approach," *Oxford Economic Papers*, 35, pp. 23-44.
- Frey, Bruno S. and Hannelore Weck-Hannemann (1984): The hidden economy as an "unobserved" variable, *European Economic Review*, 26/1, pp. 33-53.
- Frey, Bruno S. and Werner Pommerehne (1984): The hidden economy: State and prospect for measurement, *Review of Income and Wealth*, 30/1, pp. 1-23.
- Frey, Bruno S., Weck Hannelore and Werner W. Pommerehne (1982): Has the shadow economy grown in Germany? An exploratory study, *Weltwirtschaftliches Archiv*, 118/4, pp. 499-524.
- Frey, L. (1972): *Il lavoro a domicilio in Lombardia*, Giunta Regionale Lombarda, Assessorato al Lavoro, Milan.
- Frey, L. (1975): Il potenziale di lavoro in Italia, *Documenti ISVET*, no. 50.
- Frey, L. (1978): "Il lavoro nero nel 1977 in Italia", *Tendenze della occupazione*, no. 6.
- Frey, L. (1980): "Introduzione all'analisi economica del lavoro minorile", *Economia del Lavoro*, no. 1-2, pp. 5-16.
- Garcia, Gillian (1978): "The Currency Ratio and the Subterranean Economy," *Financial Analysts Journal*, 69:1, pp. 64-66.
- Giles, David, E.A. (1999a): Measuring the hidden economy: Implications for econometric modelling, *The Economic Journal*, 109/456, pp.370-380.
- Giles, David, E.A. (1999b): Modelling the hidden economy in the tax-gap in New Zealand, *Working paper*, Department of Economics, University of Victoria, Canada.
- Giles, David, E.A., Tedds, Linsey, M. and Werkneh, Gugsu (1999): The Canadian underground and measured economies, *Working paper*, Department of Economics, University of Victoria, Canada.
- Giles, David, E.A., and Tedds, Linsey, M (2002): *Taxes and the Canadian Underground Economy*, *Canadian tax Foundation*, No.106, Canada.
- Gutmann, Pierre M. (1977): "The Subterranean Economy," *Financial Analysts Journal*, 34:1, pp. 24-27.
- Helberger, Claus and Hans Knepel (1988): "How big is the shadow economy? A re-analysis of the unobserved-variable approach of B. S. Frey and H. Weck-Hannemann", *European Economic Journal*, 32, pp. 965-76.
- Hill, Roderick and Muhammed Kabir (1996): Tax rates, the tax mix, and the growth of the underground economy in Canada: What can we infer? *Canadian Tax Journal/ Revue Fiscale Canadienne*, 44/ 6, pp. 1552-1583.

- IRS (1979): *Estimates of income unreported on individual tax reforms*, Washington D.C.: Internal revenue service, U.S. Department of the Treasury.
- IRS (1983): *Income tax compliance research: Estimates for 1973-81*, Washington D.C.: Internal revenue service, U.S. Department of the Treasury.
- Isachsen, Arne J. and Steinar Strom (1985): The size and growth of the hidden economy in Norway, *Review of Income and Wealth*, 31/1, pp. 21-38.
- Isachsen, Arne J.; Klovland, Jan and Steinar Strom (1982): The hidden economy in Norway, in: Tanzi Vito (ed.): *The underground economy in the United States and Abroad*, Heath, Lexington, pp. 209-231.
- Johnson, Simon; Kaufmann, Daniel; and Andrei Shleifer (1997): *The unofficial economy in transition*, Brookings Papers on Economic Activity, Fall, Washington D.C.
- Johnson, Simon; Kaufmann, Daniel and Pablo Zoido-Lobato (1998a): Regulatory discretion and the unofficial economy. *The American Economic Review*, 88/ 2, pp. 387-392.
- Johnson, Simon; Kaufmann, Daniel and Pablo Zoido-Lobato (1998b): *Corruption, public finances and the unofficial economy*. Washington, D.C.: The World Bank, discussion paper.
- Kirchgaessner, Gebhard (1983): Size and development of the West German shadow economy, 1955-1980, *Zeitschrift für die gesamte Staatswissenschaft*, 139/2, pp. 197-214.
- Kirchgaessner, Gebhard (1984): Verfahren zur Erfassung des in der Schattenwirtschaft erarbeiteten Sozialprodukts, *Allgemeines Statistisches Archiv*, 68/4, pp. 378-405.
- Klovland, Jan (1984): "Tax Evasion and the Demand for Currency in Norway and Sweden: Is there a Hidden Relationship?" *Scandinavian Journal of Economics*, 86:4, pp. 423-39.
- Lemieux, Thomas; Fortin, Bernard; and Pierre Fréchette (1994): The effect of taxes on labor supply in the underground economy. *The American Economic Review*, 84/No. 1, pp. 231-254.
- Lippert, Owen and Michael Walker (eds.) (1997): *The underground economy: Global evidences of its size and impact*, Vancouver, B.C.: The Frazer Institute.
- Loayza, Norman V. (1996): The economics of the informal sector: a simple model and some empirical evidence from Latin America. *Carnegie-Rochester Conference Series on Public Policy* 45, pp. 129-162.
- Lubell, Herald (1991): *The informal sector in the 1980's and 1990's*, Paris: OECD.
- MacAfee, Kerrick (1980): A Glimpse of the hidden economy in the national accounts, *Economic Trends*, 136, pp. 81-87.
- Mogensen, Gunnar V.; Kvist, Hans K.; Körmendi, Eszter and Soren Pedersen (1995): *The shadow economy in Denmark 1994: Measurement and results*, Study no. 3, Copenhagen: The Rockwool Foundation Research Unit.
- O'Higgins, Michael (1989): Assessing the underground economy in the United Kingdom, in: Feige, E.L. (ed.): *The underground economies: tax evasion and information distortion*, Cambridge: Cambridge University Press, pp. 175-195.

- O'Neill, David M. (1983): Growth of the underground economy 1950-81: Some evidence from the current population survey, *Study for the Joint Economic Committee*, U.S. Congress, Joint Committee Print 98-122, U.S. Gov. Printing Office, Washington.
- Park, T. (1979): *Reconciliation between personal income and taxable income*, pp. 1947-77, mimeo, Washington D.C.: Bureau of Economic Analysis.
- Petersen, Hans-Georg (1982): Size of the public sector, economic growth and the informal economy: Development trends in the Federal Republic of Germany, *Review of Income and Wealth*, 28/2, pp. 191-215.
- Pissarides, C. and Weber, G. (1988): An expenditure – based estimate of Britain's black economy, *CLE working paper* no. 104, London.
- Pommerehne, Werner W. and Friedrich Schneider (1985): The decline of productivity growth and the rise of the shadow economy in the U.S., *Working Paper 85-9*, University of Aarhus, Aarhus, Denmark.
- Pozo, Susan (ed.) (1996): *Exploring the underground economy: Studies of illegal and unreported activity*, Michigan: W.E. Upjohn, Institute for Employment Research.
- Rogoff, Kenneth, (1998), Blessing or Curse? Foreign and underground demand for euro notes, *Economic policy: The European Forum* 26, pp. 261-304.
- Schneider, Friedrich (1986): Estimating the size of the Danish shadow economy using the currency demand approach: An attempt, *The Scandinavian Journal of Economics*, 88/4, pp. 643-668.
- Schneider, Friedrich (1994a): Measuring the size and development of the shadow economy. Can the causes be found and the obstacles be overcome? in: Brandstaetter, Hermann, and Güth, Werner (eds.): *Essays on Economic Psychology*, Berlin, Heidelberg, Springer Publishing Company, pp. 193-212.
- Schneider, Friedrich (1994b): Can the shadow economy be reduced through major tax reforms? An empirical investigation for Austria, *Supplement to Public Finance/ Finances Publiques*, 49, pp. 137-152.
- Schneider, Friedrich (1997): The shadow economies of Western Europe, *Journal of the Institute of Economic Affairs*, 17/3, pp. 42-48.
- Schneider, Friedrich (1998): Further empirical results of the size of the shadow economy of 17 OECD-countries over time, *Paper presented at the 54. Congress of the IIPF Cordowa, Argentina and discussion paper, Department of Economics, University of Linz, Linz, Austria*.
- Schneider, Friedrich and Dominik Enste (2000): Shadow Economies: Size, Causes, and Consequences, *The Journal of Economic Literature*, 38/1, pp. 77-114.
- Simon, C.B. and A.G. Witte (1982): *Beating the system: The underground economy*, Boston, (Mas.): Urban House.
- Smith, J.D (1985): Market motives in the informal economy, in: Gaertner, W. and Wenig, A. (eds.): *The economics of the shadow economy*, Heidelberg: Springer Publishing Company, pp. 161-177.
- Tanzi, Vito (1980): "The Underground Economy in the United States: Estimates and Implications," *Banca Nazionale del Lavoro*, 135:4, pp. 427-453.

- Tanzi, Vito (1983): "The Underground Economy in the United States: Annual Estimates, 1930-1980," *IMF-Staff Papers*, 30:2, pp. 283-305.
- Tanzi, Vito (1999): Uses and Abuses of Estimates of the Underground Economy, *The Economic Journal* 109/456, pp.338-340.
- Thomas, Jim J. (1986): The underground economy in the United States: A comment on Tanzi, *IMF-Staff Papers*, Vol. 33, No. 4, pp. 782-789.
- Thomas, Jim J. (1992): *Informal economic activity*, LSE, Handbooks in Economics, London: Harvester Wheatsheaf.
- Thomas, Jim J. (1999): Quantifying the Black Economy: 'Measurement without Theory' Yet Again?, *The Economic Journal* 109/456, pp. 381-389.
- Weck, Hannelore (1983): *Schattenwirtschaft: Eine Möglichkeit zur Einschränkung der öffentlichen Verwaltung? Eine ökonomische Analyse*, Bern-Frankfurt.
- Williams, Colin C. and Jan Windebank (1995): "Black market work in the European Community: Peripheral work for peripheral localities?", *International Journal of Urban and Regional Research*, 19/1, pp. 23-39.
- Witte, A.D. (1987): The nature and extend of unreported activity: A survey concentrating on a recent US-research, in: Alessandrini, S. and Dallago, B. (eds.): *The unofficial economy: Consequences and perspectives in different economic systems*, Gower: Aldershot.
- Zilberfarb, Ben-Zion (1986): *Estimates of the underground economy in the United States, 1930-80*. IMF-Staff Papers, 33/ 4, pp. 790-798.



## WORKINGPAPERS 1991-2003

### Department of Economics, Johannes Kepler University Linz

- 9101 WEISS, Christoph: Price inertia and market structure under incomplete information. Jänner 1991. in: *Applied Economics*, 1992.
- 9102 BARTEL, Rainer: Grundlagen der Wirtschaftspolitik und ihre Problematik. Ein einführender Leitfaden zur Theorie der Wirtschaftspolitik. Jänner 1991; Kurzfassung erschienen unter: Wirtschaftspolitik in der Marktwirtschaft, in: *Wirtschaft und Gesellschaft*, 17. 1991,2, S. 229-249
- 9103 FALKINGER, Josef. External effects of information. Jänner 1991
- 9104 SCHNEIDER, Friedrich; Mechanik und Ökonomie: Keplers Traum und die Zukunft. Jänner 1991, in: R. Sandgruber und F. Schneider (Hrsg.), "Interdisziplinarität Heute", Linz, Trauner, 1991
- 9105 ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf: Manpower training programs and employment stability, in: *Economica*, 63. 1995, S. 128-130
- 9106 ZWEIMÜLLER, Josef: Partial retirement and the earnings test. Februar 1991, in: *Zeitschrift für Nationalökonomie / Journal of Economics*, 57. 1993,3, S. 295-303
- 9107 FALKINGER, Josef: The impacts of policy on quality and price in a vertically integrated sector. März 1991. Revidierte Fassung: On the effects of price or quality regulations in a monopoly market, in: *Jahrbuch für Sozialwissenschaft*.
- 9108 PFAFFERMAYR, Michael, WEISS, Christoph R., ZWEIMÜLLER, Josef: Farm income, market wages, and off-farm labour supply, in: *Empirica*, 18, 2, 1991, S. 221-235
- 9109 BARTEL, Rainer, van RIETSCHOTEN, Kees: A perspective of modern public auditing. Pleading for more science and less pressure-group policy in public sector policies. Juni 1991, dt. Fassung: Eine Vision von moderner öffentlicher Finanzkontrolle, in: *Das öffentliche Haushaltswesen in Österreich*, 32. 1991,3-4, S. 151-187
- 9110 SCHNEIDER, Friedrich and LENZELBAUER, Werner: An inverse relationship between efficiency and profitability according to the size of Upper-Austrian firms? Some further tentative results, in: *Small Business Economics*, 5. 1993,1, S. 1-22
- 9111 SCHNEIDER, Friedrich: Wirtschaftspolitische Maßnahmen zur Steigerung der Effizienz der österreichischen Gemeinwirtschaft: Ein Plädoyer für eine aktivere Industrie- und Wettbewerbspolitik. Juli 1991, in: *Öffentliche Wirtschaft und Gemeinwirtschaft in Österreich*, Wien, Manz, 1992, S. 90-114
- 9112 WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Unequal promotion on job ladders, in: *Journal of Labor Economics*, 15. 1997,1,1, S. 70-71
- 9113 BRUNNER, Johann K.: Bargaining with reasonable aspirations. Oktober 1991, in: *Theory and Decision*, 37, 1994, S. 311-321.
- 9114 ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf: Gender wage differentials and private and public sector jobs. Oktober 1991, in: *Journal of Population Economics*, 7. 1994, S. 271-285
- 9115 BRUNNER, Johann K., WICKSTRÖM, Bengt-Arne: Politically stable pay-as-you-go pension systems: Why the social-insurance budget is too small in a democracy. November 1991, in: *Zeitschrift für Nationalökonomie = Journal of Economics*, 7. 1993, S. 177-190.
- 9116 WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Occupational segregation and career advancement. Dezember 1991, in: *Economics Letters*, 39. 1992, S. 229-234
- \*\*\*
- 9201 SCHNEIDER, Friedrich: Ecological objectives in a market economy: Three simple questions, but no simple answers? Jänner 1992, in: Giersch, H. (Hrsg.), *Environmental economics*, Heidelberg, Springer-Verl., 1993
- 9202 SCHNEIDER, Friedrich: The federal and fiscal structures of representative and direct democracies as models for a European federal union: Some preliminary ideas using the public-choice approach, in: *Journal des Economistes et des Etudes Humaines*, 3. 1993,2
- 9203 SCHNEIDER, Friedrich: The development of the shadow economy under changing economic conditions: Some tentative empirical results for Austria. Revised version. März 1992.
- 9204 HACKL, Franz, SCHNEIDER, Friedrich, WITHERS, Glenn: The public sector in Australia: A quantitative analysis. März 1992, in: Gemmell, N. (ed.), *The growth of the public sector*, Aldershot, Elgar, 1993, S. 212-231
- 9205 SCHNEIDER, Friedrich: The federal and fiscal structures of western democracies as models for a federal union in former communist countries? Some thoughts using the public-choice approach. April 1992, in: Wagner, H.-J. (ed.), *On the theory and policy of systematic change*, Heidelberg, Springer-Verl., 1993, S. 135-154
- 9206 WINTER-EBMER, Rudolf: Endogenous growth, human capital, and industry wages. in: *Bulletin of Economic Research*, 4/1994, 289-314.
- 9207 BARTEL, Rainer: Gleichgewicht, Ungleichgewicht und Anpassung in der komparativen Statik. August 1992; 1. Teil erschienen unter: Auf welchen Grundlagen beruhen unsere ökonomischen Aussagen? in: *Wirtschaft und Gesellschaft*, 19, 2, 1993, S. 153-170; 2. Teil erschienen unter: Neoklassische Rationierung, in: *WiSt*, 23, 3, 1993, S. 151-154
- 9208 WEISS, Christoph R.: Market structure and pricing behaviour in Austrian manufacturing. August 1992, in: *Empirica*, 21. 1994, S. 115-131.
- 9209 WINTER-EBMER, Rudolf: Unemployment and individual pay: Wage curve or compensating differentials? erscheint u.d.T.: Wage Curve, Unemployment Duration and Compensating Differentials, in: *Labour Economics*, 3/1996,4, S. 425-434
- 9210 SCHUSTER, Helmut: Chaostheorie und Verkehrswissenschaft? September 1992, in: *Österreichische Zeitschrift für Verkehrswissenschaft*, 1-2, 38. 1992, S. 48-51
- 9211 BARTEL, Rainer, PRUCKNER, Gerald: Strukturelle und konjunkturelle Charakteristika der Budgetpolitik von Bund und Gesamtstaat in Österreich. Oktober 1992, in: *Wirtschaftspolitische Blätter*, 40. 1993,2, S. 134-154
- 9212 PFAFFERMAYR, Michael: Foreign direct investment and exports: A time series approach. Oktober 1992
- 9213 HACKL, Franz, SCHNEIDER, Friedrich: Austrian economic policy since 1945: An exploratory analysis. Oktober 1992, in: Paldam, M. (ed.), *Economic development of small open economies in Europe and South America*, Basingstoke, Macmillan, forthcoming 1994
- 9214 SCHNEIDER, Friedrich: Die Kunst als Wirtschaftsfaktor - vernachlässigbar oder beachtenswert? Oktober 1992, in: *Musicologica Austriaca*, 11. 1993,1, S. 19-29
- 9215 SCHNEIDER, Friedrich: Measuring the size and the development of the shadow economy: Can the causes be found and the obstacles be overcome? November 1992, in: Brandstätter, Hermann and Güth, W. (eds.), *Essays on Economic Psychology*, Heidelberg, Springer-Verl., 1994, S. 208-211
- 9216 SCHNEIDER, Friedrich: Public choice - economic theory of politics: A survey in selected areas. Dezember 1992, in: Brandstätter, Hermann and Güth, W. (eds.), *Essays on Economic Psychology*, Heidelberg, Springer-Verl., 1994, S. 188-192

- \*\*\*
- 9301 SCHUSTER, Helmut: Energiepolitik im Spannungsfeld zwischen Wirtschaft und Umwelt. Jänner 1993, in: Friedrich Schneider (Hrsg.), *Energiepolitik in Österreich*, Linz, Trauner, 1993
- 9302 WINTER-EBMER, Rudolf: Motivation to migrate and economic success. März 1993, erscheint u.d.T.: Motivation for Migration and Economic Success, in: *Journal of Economic Psychology*, 15. 1994, S. 282-284
- 9303 LANDESMANN, Michael and GOODWIN, Richard: Productivity growth, structural change and macroeconomic stability. März 1993
- 9304 PFAFFERMAYR, Michael: Foreign outward direct investment and exports in Austrian manufacturing. März 1993
- 9305 BARTEL, Rainer: Zur Ökonomie der öffentlichen Finanzkontrolle. April 1993, erschienen unter: Öffentliche Finanzkontrolle als politische Machtkontrolle. Eine ökonomische Fundierung, in: *Politische Vierteljahresschrift*, 34. 1993,4, S. 613-639
- 9306 HACKL, Franz: Die Internalisierung von überbetrieblichen Leistungen der Landwirtschaft aus allokatorentheoretischer Sicht. April 1993.
- 9307 ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf, FALKINGER, Josef: Retirement of spouses and social security reform, in: *European Economic Review*, 40/1996, S. 471-472
- 9308 BRUNNER, Johann K.: Abilities, needs, and the size of the cake: an axiomatic bargaining approach to redistributive taxation. Juli 1993.
- 9309 HACKL, Franz, PRUCKNER, Gerald: Touristische Präferenzen für den ländlichen Raum: Die Problematik ihrer empirischen Erfassung und Internalisierung. Juli 1993. Ersch. in: *Gesellschaftliche Forderungen an die Landwirtschaft / Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaues (GEWISOLA)*, hrsg. von Konrad Hagedorn ... 1994, Schriften der GEWISOLA, Bd. 30
- 9310 NECK, Reinhard, SCHNEIDER, Friedrich: Steuersystem und Schattenwirtschaft. Juli 1993.
- 9311 POINTNER, Johannes und SCHNEIDER, Friedrich: Österreich im internationalen Wirtschaftssystem, August 1993, in: Ewald Nowotny und Günther Winckler (Hrsg.), *Grundzüge der Wirtschaftspolitik Österreichs*, 1994.
- 9312 SCHNEIDER, Friedrich: The Relationship between efficiency and profitability with respect to the size of firms: an empirical investigation for Austria. September 1993.
- 9313 ÖTSCH, Walter: Die mechanistische Metapher in der Theoriengeschichte der Nationalökonomie. September 1993.
- 9314 BARTEL, Rainer: Wirtschaftspolitische Kontrolle und Beratung: Grundlagen, Probleme, Erfordernisse. September 1993, erschienen als: Kontrolle und Beratung in der Wirtschaftspolitik, in: *Wirtschaftspolitische Blätter*, 41. 1994,4, S. 442-462
- 9315 BARTH, Erling and ZWEIMÜLLER, Josef: Relative wages under decentralized and under corporatist bargaining systems, in: *Scandinavian Journal of Economics*, 97. 1995,3, S. 369-384
- 9316 FALKINGER, Josef and ZWEIMÜLLER, Josef: The impact of income inequality on product diversity and economic growth. Oktober 1993.
- 9317 SCHNEIDER, Friedrich: Anreizorientierte Systeme im Gesundheitswesen unter besonderer Berücksichtigung des stationären Sektors. Oktober 1993.
- 9318 HORSTMANN, Winfried and SCHNEIDER, Friedrich: Deficits, bailout and free riders: Fiscal elements of European constitution. Oktober 1993.
- 9319 BARTEL, Rainer: Egoismus, Altruismus, Ineffizienz und Kontrolle im öffentlichen Bereich: Ein kurzer Blick auf die Argumente und ihre Implikationen. November 1993, in: *Wirtschaft und Gesellschaft*, 20. 1994,2, S. 231-246
- 9320 BURGER, Christina: Theorien der Koalitionsbildung und ihre Anwendbarkeit auf österreichische Regierungen. November 1993.
- 9321 BARTEL, Rainer: Konjunkturelle Selbststabilisierung oder kompensatorische Nachfragepolitik? Ein Leitfaden für Studenten. Dezember 1993, tw. erschienen unter: Konjunk-  
turprobleme - Selbstheilung oder Staatseingriffe?, in: *WISO*, 17. 1994,4, S. 111-39, erscheint tw. unter: Lohnindexierung - Effiziente Institution zur Stabilisierung der Wirtschaft?, in: *WiSt*, 26. 1997,3, S. 154-156
- \*\*\*
- 9401 WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Immigration and the Earnings of Young Native Workers. Jänner 1994, in: *Oxford Economic Papers*, 48. 1996, S. 473-491
- 9402 KUNST, Robert, HAUSER, Michael: Fractionally Integrated Models With ARCH Errors. Jänner 1994.
- 9403 ZWEIMÜLLER, Josef, WINTER-EBMER, Rudolf: Internal Markets and Firm-Specific Determination of Earnings in the Presence of Immigrant Labor, in: *Economics Letters*, 48. 1995, S. 185-191
- 9404 SCHUSTER, Helmut: Energie und Umwelt. März 1994.
- 9405 PFAFFERMAYR, Michael: Testing for Ownership Advantages of Direct Investing Firms. März 1994.
- 9406 SCHNEIDER, Friedrich: Determinanten der Steuerhinterziehung und der Schwarzarbeit im internationalen Vergleich. März 1994.
- 9407 FALKINGER, Josef: Social Stability and the Equity-Efficiency Trade-off. April 1994.
- 9408 WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Do Immigrants Displace Native Workers? Mai 1994, erscheint in: *Journal of Population Economics*, 1998.
- 9409 FALKINGER, Josef: How to overcome free-riding: Rewarding deviations from average. Mai 1994. Revidierte Fassung: Efficient Private Provision of Public Goods by Rewarding Deviations from Average, in: *Journal of Public Economics*, 62. 1996,3, S. 413-422
- 9410 ZWEIMÜLLER, Josef: Wealth distribution, innovations, and economic growth. Mai 1994.
- 9411 GANTNER, Manfred, SCHNEIDER, Friedrich: Budgetausgliederungen - eine polit-ökonomische Analyse. Juni 1994.
- 9412 AIGINGER, Karl: The use of game theoretical models for empirical research - A survey of testing non-cooperative game theory with real world data in recent industrial organization literature. Juni 1994.
- 9413 FALKINGER, Josef: The private provision of public goods when the relative size of contribution matters. Juli 1994, in: *Finanzarchiv*, 51, 1994, S. 358 - 371.
- 9414 WINTER-EBMER, Rudolf: Sex discrimination and competition in product and labour markets, in: *Applied Economics*, 27. 1995,9, S. 849-857
- 9415 FALKINGER, Josef, ZWEIMÜLLER, Josef: The cross-country Engel curve for product diversification, August 1994, in: *Structural Change and Economic Dynamics*, 7. 1996,1, S. 79-97
- 9416 FALKINGER, Josef: Tax evasion, consumption of public goods and fairness, August 1994, in: *Journal of Economic Psychology*, 16, 1995, S. 63 - 72.
- 9417 SCHNEIDER, Friedrich: Einige Gedanken zur Harmonisierung indirekter Steuern in der Europäischen Union, September 1994.
- 9418 WINTER-EBMER, Rudolf: Firm size, earnings and displacement risk, Oktober 1994, erscheint in: *Economic Inquiry*, 2000.
- 9419 WEISS, Christoph: Labour market adjustment in U.S. manufacturing: Does market structure matter? Oktober 1994.
- 9420 WEISS, Christoph: State dependence, symmetry and reversibility of off-farm employment, November 1994.
- 9421 SCHNEIDER, Friedrich: Is there a European public choice perspective?, Dezember 1994.
- \*\*\*
- 9501 BARTEL, Rainer: Reform des öffentlichen Sektors - Grundlagen und Grundsätze. Jänner 1995.
- 9502 RIESE, Martin: The GINI-index as a measure of the goodness of prediction, Jänner 1995, in: *Bulletin of Economic Research*, 49. 1997,2, S. 127-135.
- 9503 AIGINGER, Karl, WINTER-EBMER, Rudolf und ZWEIMÜLLER, Josef: Eastern European Trade and the Austrian

- Labour Market, in: *Weltwirtschaftliches Archiv*, 132. 1996,3, S. 476-500
- 9504 WEISS, Christoph: Size, Growth, and Survival of Upper Austrian Farms in the 1980s, Februar 1995. in: Sotte, F. and Zanoli, R.: "The Regional Dimension of Agricultural Economics and Politics", forthcoming (1995).
- 9505 BARTEL, Rainer: Umweltpolitik in den Reformländern Europas. Voraussetzungen und Erfordernisse, Februar 1995.
- 9506 PFAFFERMAYR, Michael: Foreign Outward Direct Investment and Exports in Austrian Manufacturing: Substitutes or Complements?, March 1995.
- 9507 BURGER, Christina, SCHNEIDER, Friedrich: How Valuable is the Health of the Elderly- Evaluation of the Treatment of Alzheimer's Disease; April 1995.
- 9508 BRUNNER, Johann, RIESE, Martin: Measuring the Severity of Unemployment, April 1995.
- 9509 SCHNEIDER, Friedrich: Volkswirtschaftliche Aspekte der Mitarbeiterbeteiligung, Mai 1995.
- 9510 ÖTSCH, Walter: Erwartungen und Framing. Keynes und die "Anomalien" der Erwartungsnutzentheorie, Mai 1995.
- 9511 ÖTSCH, Walter: Die Herausforderung des Konstruktivismus für die ökonomische Theorie, Mai 1995, in: Birger P. Priddat und Gerhard Wegner, Hrsg., Zwischen Evolution und Institution, Metropolis-Verl., Marburg, 1996, S. 35 - 55
- 9512 ÖTSCH, Walter: Kreativität und Logik im ökonomischen Handlungsmodell, Mai 1995.
- 9513 WEISS, Christoph: Determinants of Farm Survival and Growth, Mai 1995.
- 9514 BARTEL, Rainer: Zum Verhältnis von Ökonomie und Politik des öffentlichen Sektors. Einige kurze Anmerkungen, Juni 1995.
- 9515 KUNST, Robert M.: The Myth of Misspecification. Some Metaphors, Juni 1995.
- 9516 VAN DER BURG, Brigitte, SIEGERS, Jacques, WINTER-EBMER, Rudolf: Gender and Promotion in the Academic Labour Market. Juli 1995.
- 9517 FALKINGER, Josef, FEHR, Ernst, GÄCHTER, Simon, WINTER-EBMER, Rudolf: A simple mechanism for the efficient private provision of public goods - experimental evidence, August 1995, erscheint in: *American Economic Review*, 1999.
- 9518 SCHNEIDER, Friedrich: Some Elements of a European Federal Union: A Public Choice Approach, September 1995.
- 9519 BRUNNER, Johann, FALKINGER, Josef: Nonneutrality of taxes and subsidies for the private provision of public goods, September 1995.
- 9520 WEISS, Christoph: Product Market Power and Dynamic Labour Demand, September 1995.
- 9521 LANDESMANN, Michael, PFAFFERMAYR, Michael: Technological Competition and Trade Performance, October, 1995.
- \*\*\*
- 9601 WEISS, Christoph: Exits From a Declining Sector: Econometric Evidence From a Panel of Upper-Austrian Farms 1980-90., Jänner 1996.
- 9602 BÖS, Dieter und SCHNEIDER, Friedrich: Private-public partnership: Gemeinschaftsunternehmen zwischen Privaten und der öffentlichen Hand, Februar 1996.
- 9603 GÄCHTER, Simon, FEHR, Ernst, KMENT, Christiane: Does Social Exchange Increase Voluntary Cooperation?, Februar 1996.
- 9604 ZWEIMÜLLER, Josef, BRUNNER, Johann: Heterogeneous consumers, vertical product differentiation and the rate of innovation, März 1996.
- 9605 SCHNEIDER, Friedrich: The Contributions of Werner W. Pommerehne to Public Choice, März 1996.
- 9606 SEDJAV, Tsagaan-Uvgun: Wissenschaftlich-technologische Entwicklungsfragen der Mongolei, April 1996, Wissenschaftlicher Betreuer: o.Univ.-Prof. Dr. Helmut Schuster, B.Com.
- 9607 KEUSCHNIGG, Christian u. KOHLER Wilhelm: Innovation, Capital Accumulation and Economic Transition, revised version April 1996.
- 9608 AIGINGER, Karl: Beyond Trade Balances: the competitive race between the US, Japan and Europe, Juni 1996.
- 9609 POMMEREHNE, Werner W., HART, Albert und SCHNEIDER, Friedrich: Tragic Choices and Collective Decision-Making: An Empirical Study of Voter Preferences for Alternative Collective Decision-Making Mechanisms, Juli 1996.
- 9610 BARTEL, Rainer, POINTNER, Johannes, SCHNEIDER, Friedrich: Österreich im internationalen Wirtschaftssystem, Juli 1996, erschienen in: E.Nowotny und G. Winckler (Hg.), Grundzüge der Wirtschaftspolitik Österreichs, 2. Aufl., Manz-Verlag, Wien 1997, S. 49-98.
- 9611 SCHNEIDER, Friedrich, VOLKERT, Jürgen: Die Realisierung ökologisch-orientierter Wirtschaftspolitik - eine Unmöglichkeit? Überlegungen aus Sicht der Neuen Politischen Ökonomie, Juli 1996.
- 9612 AIGINGER, Karl, WEISS, Christoph R.: Does it Pay to be Flexible? Empirical Evidence on the Relationship between Labour Demand Flexibility and Profit Margins, Juli 1996.
- 9613 WEISS, Christoph R.: Beneficial Concentration in a Menu Cost Model: A Note, August 1996.
- 9614 GUSENLEITNER, Markus, WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: The Distribution of Earnings in Austria, 1972-1991, *Allgemeines Statistisches Archiv*, 3/98.
- 9615 WINTER-EBMER, Rudolf: Benefit Duration and Unemployment Entry: Quasi-Experimental Evidence for Austria, Oktober 1996.
- 9616 WINTER-EBMER, Rudolf: Potential Unemployment Benefit Duration and Spell Length: Lessons from a Quasi-Experiment in Austria, in: *Oxford Bulletin of Economics and Statistics*, 60. 1998,1, S. 33-45
- 9617 SCHNEIDER, Friedrich, FREY, Bruno S.: Warum wird die Umweltökonomik kaum angewendet?, November 1996.
- 9618 SCHNEIDER, Friedrich: Aktuelle Ergebnisse über die Schattenwirtschaft (Pfusch) in Österreich, November 1996.
- 9619 KOHLER, Wilhelm: Die langfristige Entwicklung der Transformationsländer Osteuropas: Welche Rolle spielt die Integration der Märkte?, Dezember 1996.
- 9620 BRUNNER, Johann K., PRINZ, Christopher, WIRTH, Friedrich: Die Zukunft der gesetzlichen Pensionsversicherung, Dezember 1996.
- 9621 SCHNEIDER, Friedrich, GAWEL, Erik: Umsetzungsprobleme ökologisch orientierter Steuerpolitik: Eine polit-ökonomische Analyse, Dezember 1996.
- \*\*\*
- 9701 SCHNEIDER, Friedrich: Hält der EURO, was er verspricht? Ökonomische Überlegungen zur Stabilität und zur Einführung des EURO, Jänner 1997.
- 9702 SCHNEIDER, Friedrich: Welche Chancen hat Österreich als Wirtschaftsstandort im EU- und Globalisierungskontext derzeit und in Zukunft?, Jänner 1997.
- 9703 BRUNNER, Johann K.: Ökonomische Analyse des umlagefinanzierten Pensionsversicherungssystems, Jänner 1997.
- 9704 PFAFFERMAYR, Michael, WEISS, Christoph R.: On Market Power and Investment Behaviour, January 1997.
- 9705 LANDESMANN, Michael A., STEHRER, Robert: Industrial Specialisation, Catching-up and Labour Market Dynamics, January 1997.
- 9706 BARTEL, Rainer: Taking even introductory textbooks seriously. A note on the importance of a usual neglect, February 1997.
- 9707 KUNST, Robert M.: Decision bounds for data-admissible seasonal models, March 1997.
- 9708 WINTER-EBMER, Rudolf, ZWEIMÜLLER, Josef: Intra-firm Wage Dispersion and Firm Performance, *Kyklos*, 1999.
- 9709 PRITZL, F. J. Rupert und SCHNEIDER, Friedrich: Korruption, März 1997.
- 9710 SCHNEIDER, Friedrich: Empirical Results for the Size of the Shadow Economy of Western European Countries Over Time, März 1997.

- 9711 SCHNEIDER, Friedrich und VOLKERT, Jürgen: No Chance for Incentive-orientated Environmental Policies in Representative Democracies? A Public Choice Approach, März 1997.
- 9712 FALKINGER, Josef: Wachstum, Verteilung und Beschäftigung, März 1997.
- 9713 PRITZL, F. J. Rupert und SCHNEIDER, Friedrich: Zur Politischen Ökonomie autokratischer politischer Systeme - Ein theoretischer und empirischer Ansatz, April 1997.
- 9714 SCHUSTER, Helmut: Das Phänomen der strukturellen Arbeitslosigkeit und Maßnahmen zu seiner Bekämpfung,, Mai 1997.
- 9715 BARTEL, Rainer: Paradigmatik versus Pragmatik in der (Umwelt-)Ökonomie. Eine epistemologische Sicht, Mai 1997.
- 9716 BERGER, Helge und SCHNEIDER, Friedrich: Does the Bundesbank Yield in Conflicts? Frey and Schneider Revisited, Juni 1997.
- 9717 RIESE, Martin und BRUNNER, Johann K.: Interpreting risk with demographic statistics, Juni 1997.
- 9718 KUNST, Robert M.: Asymptotics for Unit-Root Processes with Underspecified Deterministic Structures, Juni 1997.
- 9719 GAWEL, Erik und SCHNEIDER, Friedrich: Implementation Problems of Eco-Taxation: A Political-Economy Analysis, Juli 1997
- 9720 PRITZL, Rupert und SCHNEIDER, Friedrich: Political Economy of Autocratic Political Regimes: A Theoretical and Empirical Approach, Juli 1997
- 9721 WINTER-EBMER, Rudolf: Unknown Wage Offer Distribution and Job Search Duration, *Economics Letters*, 1998.
- 9722 BRUNNER, Johann K.: Optimal Taxation of Income and Bequests, August 1997
- 9723 KEUSCHNIGG, Christian und KOHLER, Wilhelm: Eastern Enlargement of the EU: How Much is it Worth for Austria?, November 1997
- 9724 HOFER, Helmut, KEUSCHNIGG, Christian und Wilhelm KOHLER, A Dynamic Applied General Equilibrium Model for the Austrian Economy With Special Emphasis on the Eastern EU Enlargement, November 1997.
- \*\*\*
- 9801 WINTER-EBMER, Rudolf und Klaus F. ZIMMERMANN: East-West Trade and Migration: The Austro-German Case, Jänner 1998, erscheint in: Jaime de Melo, Riccardo Faini und Klaus F. Zimmermann (eds.): *Trade and Factor Mobility*, Cambridge (CUP).
- 9802 ICHINO, Andrea und Rudolf WINTER-EBMER: The Long-Run Educational Cost of World War 2: An Application of Local Average Treatment Effect Estimation, Jänner 1998.
- 9803 SCHNEIDER, Friedrich: Deregulierung und Privatisierung als Allheilmittel gegen ineffiziente Produktion von öffentlichen Unternehmen? Ein Erklärungsversuch mit Hilfe der ökonomischen Theorie der Politik, Jänner 1998.
- 9804 SCHNEIDER, Friedrich: Märkte, Moral und Umwelt: Was sagt die Ökonomie dazu?, Jänner 1998.
- 9805 LENK, Thomas, FUGE, Heidi und SCHNEIDER, Friedrich: Zurück zu mehr Föderalismus: Ein Vorschlag zur Neugestaltung des Finanzausgleichs in der BRD unter besonderer Berücksichtigung der ökonomischen Theorie der Politik, Jänner 1998.
- 9806 SCHNEIDER, Friedrich: Stellt das starke Anwachsen der Schwarzarbeit eine wirtschaftspolitische Herausforderung dar? Einige Gedanken aus volkswirtschaftlicher Sicht, Jänner 1998.
- 9807 SCHNEIDER, Friedrich: Einige grundlegende Elemente einer europäisch-föderalen Verfassung unter Zuhilfenahme der konstitutionellen ökonomischen Theorie, Jänner 1998.
- 9808 LANDESMANN, Michael: Vertical product differentiation and international trade: an econometric analysis, März 1998.
- 9808a BARTEL, Rainer: Öffentliche Finanzen, Finanzkontrolle und gesellschaftliche Wohlfahrt. Volkswirtschaftliche Thesen, Antithesen und mögliche Synthesen, März 1998. Erschienen in überarbeiteter Version in: F. Klug (Hrsg.), *Wesen und staatspolitische Funktion der öffentlichen Finanzkontrolle*, Schriftenreihe des Instituts für Kommunalwissenschaften an der Universität Linz, Bd. 107, S. 85-127.
- 9809 AIGINGER, Karl und PFAFFERMAYR, Michael: Product quality, cost asymmetry and the welfare loss of oligopoly, Februar 1998.
- 9810 KOHLER, Wilhelm: Die Ost-Erweiterung der EU: Eine österreichische Perspektive, April 1998.
- 9811 BERGER, Mathias und SCHNEIDER, Friedrich: Schattenwirtschaft und Steuerhinterziehung: Ökonomische und psychologische Aspekte, April 1998.
- 9812 SCHNEIDER, Friedrich und STIEGLER, Harald: Controlling als effizienzsteigerndes Instrument der Universitätsführung – Zauber- oder Leerformel?, April 1998.
- 9813 KUNST, Robert M.: Some aspects of modeling seasonality in economic time series, Juni 1998.
- 9814 KOHLER, Wilhelm: Fifty Years Later: A New Marshall Plan for Eastern Europe?, Juli 1998.
- 9815 RAPHAEL, Steven und WINTER-EBMER, Rudolf: Identifying the Effect of Unemployment on Crime, September 1998.
- 9816 ICHINO, Andrea und WINTER-EBMER, Rudolf: Lower and Upper Bounds of Returns to Schooling: An Exercise in IV Estimation with Different Instruments, September 1998, erscheint in: *European Economic Review*, 1999.
- 9817 PÖLL, Günther und SCHNEIDER, Friedrich: Schattenwirtschaft, Juli 1998.
- 9818 BRUNNER, Johann K.: Kapitaldeckungsverfahren versus Umlageverfahren: Grundsätzliches zur Systemdiskussion, August 1998.
- 9819 SCHNEIDER, Friedrich und ENSTE, Dominik: Increasing Shadow Economies all over the world - Fiction or Reality? A Survey of the Global Evidence of its Size and of its Impact from 1970 to 1995, November 1998.
- 9820 LENK, Thomas und SCHNEIDER, Friedrich: Zurück zu mehr Föderalismus: Ein Vorschlag zur Neugestaltung des Finanzausgleichs in der Bundesrepublik Deutschland unter besonderer Berücksichtigung der neuen Bundesländer, November 1998.
- 9821 KOHLER, Wilhelm: Die Bedeutung der EU-Osterweiterung für verschiedene Sektoren der österreichischen Wirtschaft, November 1998.
- 9822 KOHLER, Wilhelm: Die pan-europäische Integration: Herausforderungen für die Wirtschaftswissenschaft, November 1998.
- 9823 ATKINSON, Anthony B.: The Changing Distribution of Income: Evidence and Explanations (I. K.W. Rothschild Vorlesung), November 1998.
- 9824 PECH, Susanne und PFAFFERMAYR, Michael: Strategic Environmental Taxation in the Presence of Involuntary Unemployment and Endogenous Location Choice, November 1998.
- 9825 BARTEL, Rainer: Reform und Öffnung Osteuropas, November 1998.
- 9826 ÖTSCH, Walter: Zur Geschichte und Zukunft von Grundkategorien des ökonomischen Denkens: Raum, Zeit, Objekt und Ich, November 1998.
- 9827 ÖTSCH, Walter: „Äußere“ und „Innere“ Glücksmodelle in der Theoriegeschichte der Ökonomie, November 1998, erscheint in: Zinn, Bellebaum und Schaaß: *Ökonomie und Glück*, Frühjahr 1999.
- 9828 ÖTSCH, Walter: Konstruktivismus und ökonomische Theorie, November 1999, erscheint in: Lehmann und Pillath: *Handbuch der Evolutorischen Ökonomik*, Springer Verlag, 1999.
- \*\*\*
- 9901 WINTER-EBMER, Rudolf und ZWEIMÜLLER, Josef: Firm Size Wage Differentials in Switzerland: Evidence from Job Changers, Jänner 1999, erscheint in: *American Economic Review, Papers & Proceedings*, 1999.
- 9902 BRANDSTÄTTER, Eduard, KÜHBERGER, Anton und SCHNEIDER, Friedrich: "Surprise in Decision making under Uncertainty, Jänner 1999.

- 9903 SCHNEIDER, Friedrich und WAGNER, Alexander: "The Role of International Monetary Institutions after the EMU and after the Asian Crises: Some Preliminary Ideas Using Constitutional Economics", Februar 1999
- 9904 BRUNNER, Johann K.: Transfers zwischen den Generationen, Februar 1999.
- 9905 LACKÓ, Mária: Hidden Economy – An Unknown Quantity? Comparative Analysis of Hidden Economies in Transition Countries in 1989-1995, Februar 1999
- 9906 KOHLER, Wilhelm: Trade and Wages: What Can Factor Contents Tell Us? Februar 1999.
- 9907 LANDESMANN, Michael und STEHRER Robert: The European Unemployment Problem: A Structural Approach, März 1999.
- 9908 SCHNEIDER, Friedrich: Das Verhältnis von Innovation und Beschäftigung aus wirtschaftlicher Sicht – Jobkiller oder Jobwunder?, Mai 1999.
- 9909 SCHNEIDER, Friedrich und LENK, Thomas: Zurück zum Trennsystem als Königsweg zu mehr Föderalismus in Zeiten des „Aufbau Ost“, Juni 1999.
- 9910 SCHNEIDER, Friedrich: Die Entwicklung der Sozialpolitik in repräsentativen und in direkten Demokratien: Königsweg oder Sackgasse? Einige Bemerkungen aus der „Public Choice“-Perspektive, Juni 1999.
- 9911 SCHNEIDER, Friedrich: Ist Schwarzarbeit ein Volkssport geworden? Ein internationaler Vergleich des Ausmaßes der Schwarzarbeit von 1970 bis 1997, Juni 1999.
- 9912 FELBERMAYR, Gabriel, und KOHLER, Wilhelm: Zur ökonomischen Logik spekulativer Attacken, Juli 1999.
- 9913 FERSTERER, Josef und WINTER-EBMER, Rudolf: Returns to Education - Evidence for Austria, August 1999.
- 9914 BARTEL, Rainer: Social economic issues in sexual orientation – Where do we stand?, September 1999.
- 9915 SCHNEIDER, Friedrich und ENSTE, Dominik: Shadow Economies: Sizes, Causes, and Consequences, September 1999.
- 9916 BARTEL, Rainer: Ökonomische Rationalität im System der öffentlichen Finanzkontrolle. Die Funktionalität des neuen Oö. Landesrechnungshofs, September 1999.
- 9917 FERSTERER, Josef und Rudolf WINTER-EBMER: Are Austrian Returns to Education Falling Over Time?, Oktober 1999.
- 9918 SCHNEIDER, Friedrich und WINNER, Hannes: Ein Vorschlag zur Reform der österreichischen Unternehmensbesteuerung, November 1999.
- 9919 SCHNEIDER, Friedrich: Induzieren ökologische Steuerreformen einen Lenkungseffekt oder nur volle Staatskassen? Einige volkswirtschaftliche Überlegungen, November 1999.
- 9920 KOHLER, Wilhelm: Wer gewinnt, wer verliert durch die Osterweiterung der EU?, November 1999.
- 9921 DRÈZE, Jacques: On the Macroeconomics of Uncertainty and Incomplete Markets, November 1999.
- 9922 STIGLBAUER, Alfred M. und WEISS, Christoph R.: Family and Non-Family Succession in the Upper-Austrian Farm Sector, Dezember 1999.
- 9923 HOLZLEITNER, Christian: Linear Profit-Sharing in Regulatory Contracts, Dezember 1999.
- 9924 ÖTSCH, Walter: Objekt, Subjekt und Wert. Zur Kulturgeschichte in Georg Simmels "Philosophie des Geldes", Dezember 1999.
- \*\*\*
- 0001 KOHLER, Wilhelm: Die Osterweiterung der EU aus der Sicht bestehender Mitgliedsländer: Was lehrt uns die Theorie der ökonomischen Integration?, Jänner 2000.
- 0002 FERSTERER, Josef und WINTER-EBMER, Rudolf: Smoking, Discount Rates, and Returns to Education, Jänner 2000.
- 0003 BARTEL, Rainer: Quo vadimus. Grundgedanken zum Verhältnis von Wirtschaft, Staat und Gesellschaft, Februar 2000.
- 0004 SCHNEIDER, Friedrich und FREY, Bruno S.: Informal and Underground Economy, Februar 2000.
- 0005 SCHNEIDER, Friedrich und FELD, Lars P.: State and Local Taxation, Februar 2000.
- 0006 ZWEIMÜLLER, Josef und WINTER-EBMER, Rudolf: Firm-specific Training - Consequences for Job Mobility, März 2000.
- 0007 SCHNEIDER, Friedrich: Schattenwirtschaft – Tatbestand, Ursachen, Auswirkungen, April 2000
- 0008 SCHNEIDER, Friedrich: The Increase of the Size of the Shadow Economy of 18 OECD Countries: Some Preliminary Explanations, April 2000.
- 0009 SCHNEIDER, Friedrich und AHLHEIM, Michael: Allowing for Household Preferences in Emission Trading – A Contribution to the Climate Policy Debate, Mai 2000
- 0010 SCHNEIDER, Friedrich: Illegal Activities, but still value added ones (?): Size, Causes, and Measurement of the Shadow Economies all over the World, Mai 2000.
- 0011 WEICHSELBAUMER, Doris: Is it Sex or Personality? The Impact of Sex-Stereotypes on Discrimination in Applicant Selection, Mai 2000.
- 0012 FELBERMAYR, Gabriel, und KOHLER, Wilhelm: Effizienz- und Verteilungswirkungen der Handelsliberalisierung, Juni 2000.
- 0013 EGGER, Peter und PFAFFERMAYR, Michael: Trade, Multinational Sales, and FDI in a Three-Factors Model, Juni 2000.
- 0014 LANDESMANN, Michael und STEHRER, Robert: Potential Switchovers in Comparative Advantage: Patterns of Industrial Convergence, Juni 2000.
- 0015 SCHNEIDER, Friedrich und WAGNER, Alexander: Korporatismus im europäischen Vergleich: Förderung makroökonomischer Rahmenbedingungen?, Juli 2000.
- 0016 SCHNEIDER, Friedrich und LENK, Thomas: Grundzüge der föderalen Finanzverfassung aus ökonomischer Perspektive: Trennsystem vs. Verbundsystem, Juli 2000.
- 0017 HOLZLEITNER, Christian: Efficient Cost Passthrough, August 2000.
- 0018 HOLZLEITNER, Christian: Evolution of Regulatory Contracts in the Real World - A Change for Good?, August 2000.
- 0019 KOHLER, Wilhelm: International Fragmentation: A Policy Perspective, August 2000.
- 0020 KOHLER, Wilhelm: A Specific-Factors View on Outsourcing, August 2000.
- 0021 WEICHSELBAUMER, Doris: Sexual Orientation Discrimination in Hiring, September 2000.
- 0022 KOHLER, Wilhelm: Internationale Migration: Anmerkungen aus der Sicht der Außenwirtschaftstheorie, Oktober 2000.
- 0023 AIGINGER, Karl und DAVIES, S.W.: Industrial Specialisation and geographic Concentration: Two sides of the same coin? Not for the European Union, Oktober 2000.
- 0024 EGGER, Hartmut und EGGER, Peter: Outsourcing and Skill-Specific Employment in a Small Economy: Austria and the Fall of the Iron Curtain, Oktober 2000.
- 0025 KOHLER, Wilhelm: An Incumbent Country View on Eastern Enlargement of the EU - Part I: A General Treatment, November 2000.
- 0026 KOHLER, Wilhelm: An Incumbent Country View on Eastern Enlargement of the EU - Part II: The Austrian Case, November 2000.
- 0027 FREY, Bruno S.: What are the sources of happiness?, November 2000
- 0028 RIESE, Martin: Weakening the SALANT-condition for the Comparison of mean durations, Dezember 2000
- 0029 WINTER-EBMER, Rudolf: Long-term consequences of an innovative redundancy-retraining project: The Austrian Steel Foundation, Dezember 2000.

- 0030 BRUNNER, Johann K. und PECH, Susanne: Adverse Selection in the annuity market when payoffs vary over the time of retirement, Dezember 2000.
- \*\*\*
- 0101 KOHLER, Wilhelm: Osterweiterung der EU: Die Mitgliedschaft wird teurer – Wird sie auch wertvoller?, Jänner 2001.
- 0102 STEHRER, Robert: Industrial specialisation, trade, and labour market dynamics in a multisectoral model of technological progress, Jänner 2001.
- 0103 SCHNEIDER, Friedrich; SALHOFER, Klaus; SCHMID, Erwin, und STREICHER, Gerhard: Was the Austrian Agricultural Policy Least Cost Efficient?, März 2001.
- 0104 SCHNEIDER, Friedrich; KIRCHLER, Erich und MACIEJOVSKY, Boris: Social Representations on Tax Avoidance, Tax Evasion, and Tax Flight: Do Legal Differences Matter?, März 2001.
- 0105 SCHNEIDER, Friedrich; PITLIK, Hans, und STROTSMANN, Harald: On the Politicization of Intergovernmental Fiscal Relations in Germany after Unification, März 2001.
- 0106 SCHNEIDER, Friedrich: Privatisierung und Deregulierung in Österreich in den 90er Jahren: Einige Anmerkungen aus Sicht der Neuen Politischen Ökonomie, März 2001.
- 0107 SCHNEIDER, Friedrich; BRAITHWAITE, Valerie, and REINHART, Monika: Individual Behavior in the Cash / Shadow Economy in Australia: Facts, Empirical Findings and some Mysteries, März 2001.
- 0108 BRUNELLO, Giorgio; LUCIFORA, Claudio, und WINTER-EBMER, Rudolf: The Wage Expectations of European College Students, März 2001.
- 0109 BRUNNER, Johann K. und PECH, Susanne: Die Dritte Säule der Altersvorsorge - Sparen und Versichern?, Juni 2001.
- 0110 STÖGER, Klaus und WINTER-EBMER, Rudolf: Lehrlingsausbildung in Österreich: Welche Betriebe bilden Lehrlinge aus? Juli 2001.
- 0111 HEIJDRÄ, Ben J.; KEUSCHNIGG, Christian, und KOHLER, Wilhelm: Eastern Enlargement of the EU: Jobs, Investment and Welfare in Present Member Countries, Oktober 2001
- 0112 BRUNNER, Johann und BUCHEGGER, Reiner: Gesundheitsgüter und Gesundheitsdienstleistungen in Österreich, Dezember 2001.
- 0113 MALINVAUD, Edmond: On methodology in macroeconomics – with application to the demand for unskilled labour, November 2001.
- \*\*\*
- 0201 KOHLER, Wilhelm: The Distributional Effects of International Fragmentation, April 2002.
- 0202 WINTER-EBMER, Rudolf and WIRZ, Annela: Public Funding and Enrolment into Higher Education in Europe, April 2002.
- 0203 KOHLER, Wilhelm: Issues of US-EU Trade Policy, May 2002.
- 0204 BRUNNER, Johann K. und PECH, Susanne: Adverse selection in the annuity market with sequential and simultaneous insurance demand, May 2002.
- 0205 Stiglitz, Alfred, Stahl, Florian, Winter-Ebmer, Rudolf and Josef Zweimüller: Job Creation and Job Destruction in a Regulated Labor Market: The Case of Austria, July 2002.
- 0206 René Böheim and Mark P Taylor: Job search methods, intensity and success in Britain in the 1990s, July 2002.
- 0207 BURGSTALLER, Johann: Are stock returns a leading indicator for real macroeconomic developments?, July 2002.
- 0208 KOHLER, Wilhelm: Aspects of International Fragmentation, August 2002.
- 0209 PECH Susanne: Tax incentives for private life annuities and the social security reform: effects on consumption and on adverse selection, August 2002.
- 0210 BRUNELLO, Giorgio and WINTER-EBMER, Rudolf: Why Do Students Expect to Stay Longer in College? Evidence from Europe, August 2002.
- 0211 RIESE, Martin: A New Class of Ageing Distributions, December 2002.
- 0212 BRUNNER, Johann K.: Welfare Effects of Pension Finance Reform, December 2002.
- \*\*\*
- 0301 SCHNEIDER, Friedrich and BAJADA, Christopher: The Size and Development of the Shadow Economies in the Asia-Pacific, April 2003.
- 0302 SCHNEIDER, Friedrich, CHAUDHURI, Kausik and CHATTERJEE, Sumana: The Size and Development of the Indian Shadow Economy and a Comparison with other 18 Asian Countries: An Empirical Investigation, April 2003.
- 0303 SCHNEIDER, Friedrich, WAGNER, Alexander F. and DUFOUR, Mathias: Satisfaction not guaranteed - Institutions and satisfaction with democracy in Western Europe, April 2003.
- 0304 SCHNEIDER, Friedrich and WAGNER, Alexander, F.: Tradeable permits - Ten key design issues, April 2003.