

Cadastre as a Compact Tool for Proper Land Use – via Taxation and Physical Planning

Andrzej HOPFER, Poland

Key words:

SUMMARY

The assumption of the paper is that land taxation can be used as an instrument of land - use planning.. If land is taxed so as to raise income for the public benefit, or if charges are levied on development, to help finance the external works, then it is usually the result that the tax has no, or only a small effect on land use. The size of effects can be estimated. The elements of theory used for marketing such estimation will be presented.

Assumption that the land tax effects on land use e. g. by reduction on the simple use of land for house building and to stimulate the use of contaminated land and brownfield sites will be discussed.

The feed back between cadastre as a data "combiner" and "carrier" for land taxation and land use planning system will be finally proved.

Cadastre as a Compact Tool for Proper Land Use – via Taxation and Physical Planning

Andrzej HOPFER, Poland

1. INTRODUCTION

Every businessman knows that information is an asset. It was an asset in the Venetian time, it was an asset in de Chinese business patterns Marco Polo discerned, it was an asset in our early industry and it has become more and more an asset in our developing industrial and post industrial world.

But now, even if one does not believe in the new economy, one will observe that information is much more than an asset: it is a capital good. And we do not care only for information which has to do with the basic business of a company (like the recipes of a good cook in a restaurant, or the way to forge pure steel), but also for information about the surroundings of the business. What is the mechanism that moves these surroundings? Why do people buy any products? What do they like? At what time do they buy? What are their moods and whims? Hundreds of millions of dollars or euros are paid for information about customers. Food industry, travel agencies, producers of electronic equipment and mediane industry: they all try to get this information as a means to get access to the customer. It is the same with government agencies. Taxes, health, education, more and more use information about the subjects of the country, trying to communicate with men as 'customers', be it tax paying citizens, patients or schoolchildren.

Information has become one of the most important capital goods. And all this information can still be put in a form of simple statements. All information systems have in principle the same form: they are the beholders and it is only what is in it.

“Tapping” information is only the first step m the process of combining different information streams, using it to 'inform' the customer, are the steps following. We can call it advertising, propaganda, information or political dispute, when we are obliged and sometimes willing, to absorb all this, but the source will call it 'information'. And yes, here it is that the cackle of information begins. It is as if a discourse between information systems is forming quite a new language game, a meta language game, intermixed with all the other language games we abide in. (Schilfgaarde 2002.)

But these capital goods have to be properly used in new “game of games” a new change has taken place. Cadastral information should be the best capital good to be used for the highest and best use of our land.

2. REPETITION ABOUT CADASTRE

A cadastre is a register of parcels of land. Throughout history the main purpose of the cadastre has been taxation of land, and during the last 2-3 centuries another purpose has been

registration of ownership and quite recently – much more different tasks (Muller, Hopfer 1989)

The earliest cadastres were created for fiscal purposes 5,000 years ago in ancient Egypt and Mesopotamia. During the last thousand years a number of cadastres has been created in Europe to improve the base of land taxation. Often the creation of the cadastre was an important step in the building of the Nation States. A famous example is the English "Doomsday Book" from 1086.

The contents of the old cadastres were typically:

- Identification of the parcel
- Name of owner / user
- Approximate land area
- Estimated agricultural output

The cadastre was created as an inventory of the land at a certain point in time, usually the not updated even when changes happened. The owner was recorded because he was responsible for the payment of the tax and as an additional identification of the property. The main purpose was to estimate the agricultural output which for example was measured in barrels of rye. The tax was then levied as a percentage of the output (e.g. 10% to the church) and paid in kind, or as an amount per barrel of rye. This way the cadastre could serve as the basis of taxation for centuries - even during periods of inflation.

The situation today is shaped by three important changes:

- From around 1700 surveying techniques improved so much that accurate cadastral maps could be produced.
- From around 1850 land registers were created giving an updated *registration of ownership*.
- From around 1900 property taxes typically became based on the *market value of land and buildings* instead of the agricultural output.

The two main “core” purposes of the cadastre are now taxation and registration of ownership, called sometimes legal cadastre and fiscal cadastre.



National Cadastre or Cadastral System

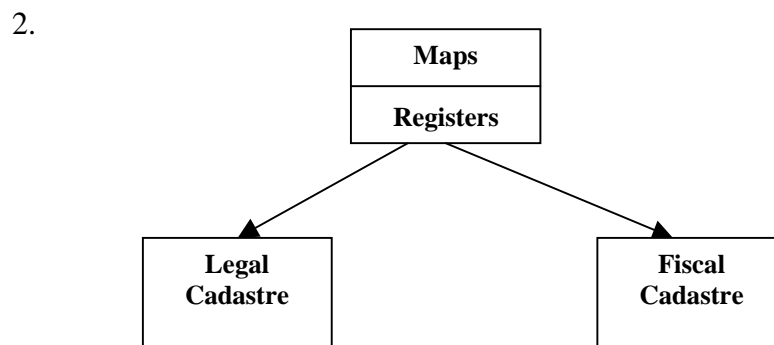


Fig. 1 Simple relation between legal and fiscal cadastre.

In situation (1) there is no relationship between the two cadastres. The legal cadastre or the land register records all transfers of land. The entry to the legal cadastre is the names of the owners and it does not give a systematic inventory of parcels in the area. This type of land register is called registration of deeds. The fiscal cadastre assigns parcel numbers to the parcels and compiles a set of information.

In situation (2) the so called “national cadastre” exists and it is a complete updated inventory of all parcels of land, and this serves as the basis for both the legal and fiscal cadastre. All parcels of land are identified by a parcel number and the land area is measured and recorded. Neither ownership nor property values or taxes are recorded in this “national cadastre”.

The legal cadastre or land registry has the cadastral parcel number as any entry. Each parcel has a page in the register where ownership, easements, and mortgages are recorded. In the deeds the transferred property is identified by the cadastral parcel number. This type of land register gives a complete and updated inventory of all parcels and owners and is called "registration of title".

In the fiscal cadastre the properties are also identified by the cadastral parcel number. Information about the land area is received from the “national cadastre”. Information about the buildings are compiled by the fiscal cadastre.

The content of a typical modern fiscal cadastre consist of:

- Identification
- Address
- Owner (name, address)
- Land description (area, quality etc.)
- Building description (areas, age, installations, materials, etc.)
- Type of property (residential, commercial, etc.)
- Market information (sales prices, rents)
- Estimated market value
- Tax

The purpose of the fiscal cadastre is to be the information base for *taxation of properties*.

The administrative procedures involved in taxation of properties are:

- Information gathering and updating
- Valuation
- Calculation of taxes
- Collection

The different parts of the fiscal cadastre are used in different procedures. The market information (sales prices, rents) are used to determine the current market value of different types of properties. This knowledge is then used to estimate the value of each single property based on the land and building description and the type of property. The estimated market value is used to calculate the tax, and the name and address of the owner is used for mailing of the tax bill.

The way a fiscal cadastre is designed and organised depends on a number of things. The more important ones are:

- Which taxes use the fiscal cadastre as an information base,
- What is the tax base and exemptions and who is liable to pay,
- How does the valuation take place,
- Can some of the information be supplied by other sources.

3. TAXATION OF PROPERTIES – GENERAL RULES

The first important point is that most countries have many taxes related to properties. In many countries a set of assessed values is used for:

- Property tax
- Imputed rent
- Annual land gain tax
- Net wealth tax

- Transfer tax
- Development gain tax
- Death and gifts tax
- Capital gain tax¹

The three most important taxes related to properties are:

- Property tax
- Transfer tax
- Imputed rent

The recurrent property tax is the "classical" tax on properties and exists in almost all countries. The transfer tax is paid when a transfer of improvable property is registered and also exists in almost all countries. Income tax of imputed rent of owner-occupied homes exists also in many countries.

Most of the taxes related to properties have to be based on assessed value. The important question is if the administration of the different taxes is so much co-ordinated that only one set of assessed value are used for all taxes.

The basis for the property tax is mostly the market value - that is the amount the property could be sold for in the open market, somewhere it that is the annual amount the property could be rented for on the open market.

For the transfer tax the base is the sales price or the assessed value.

¹ DEFINITIONS OF TAXES RELATED TO PROPERTIES.

Property Tax: Recurrent tax related to ownership or occupation of land and/or buildings. Exists in almost all countries.

Imputed Rent: Income tax of imputed rent of owner-occupied homes.

Annual Land Gain Tax: Tax on the annual increase in land value. Only exists in very few countries.

Net Wealth Tax: Tax on the value of all assets - including immovable property - minus debt.

Transfer Tax: Tax on the transfer of immovable property. Often part of at stamp duty which cover other transactions as well.

Development Cain Tax: Tax on the increase in land value due to a certain event, the event could be rezoning or public investment in infrastructure.

Death and Gift Tax: Tax on estates, inheritance and gifts -including immovable property. Rates are often progressive and depend on relationship.

Capital Gain Tax : Tax on capital gains - including gains on immovable property, most countries have a separate capital gain tax or tax capital gains under the income tax. residences are often taxed less or are exempted.

The revenue for the three most important taxes related to properties and the total revenue of the taxes related to properties – creates an important part of the total revenue of any level of government – central or local. In many countries property tax, imputed rent and transfer tax gives together an average amount of about 5 % (in USA – up to 10 %)

It means that - it is an important amount of money, which should be used - collected up or released from for broadly understood benefit of the society.

It is often debated which tax base is the better - annual rent or market value. In a way it does not matter so much, but the market value has the following advantages:

- Vacant land and the value of future development will be taxed,
- market values can be used for other taxes and even for other reasons as well.

In some countries two property taxes exists. The most important is land tax covering all types of land. The other one is a tax on the value of buildings used for business or public administration.

Also the question of whether the land alone or both land and buildings is the best tax base is often debated. In rural areas, administration of a land tax is probably easier, because in that case the fiscal cadastre does not have to include information about farm buildings and plants. In urban areas a land tax also does not require registration of buildings, but in the central urban areas very few sales of vacant land takes place so it can be difficult to defend the estimated land values. A land tax may give better incentives for development of vacant or under-utilised land in urban areas, but the value of both land and buildings might be a better base for distributing the cost of local government – these problems will be discussed in further parts of paper.

Some minor groups of properties are exempt from paying the property tax. Somewhere it is the case for government property, charities and churches, or related to transport and churches, owner-occupied business properties and owner-occupied residences.

Ideally, exemptions should be very restricted. If the tax base is broad, then the revenue can be larger or the rates can be reduced.

The administrative responsibilities concerning the property tax is usually distributed between the different levels of government, from the whole responsibilities at the local level, to both counties and municipalities. Mostly the municipalities do the collection, also for the counties, central government makes valuation with assistance from the municipalities. Land descriptions are supplied by central government (“National Cadastre”). Building descriptions are supplied by the municipalities. For the rural areas the rate is decided by central government, the municipalities are responsible for collection.

4. COORDINATION OF PROPERTY TAXATION WITH OTHER LAND RELATED ACTIVITIES

A number of very different activities have one thing in common - they are all based on information about land, buildings, infrastructure, and the human activities taking place on the land. The most important activities are:

- Land registration
- Property taxation
- Urban planning
- Urban renewal and rehabilitation of dwellings
- Environmental planning and pollution control
- Administration of building permits
- Land acquisition for development
- Management of roads, utility lines (water, sewerage, electricity) and public land

Many of these activities are based on the same information, and often information produced by one activity is used for another one.

This fact has given rise to a new subject which in essence is to take a broad view on information management concerning all the activities -mainly land information management, urban data management, or generally – land use management.

This concept is called a land information system (LIS) or a multipurpose cadastre.

Many authors: e.g. developers and other investors, land administrators, physical planners – finally social politicians, think about the system as a combine sources of information – but serving first of all for the sustainable development of a given area The picture presented on Fig. 1 can be developed to the other one (Fig. 2).

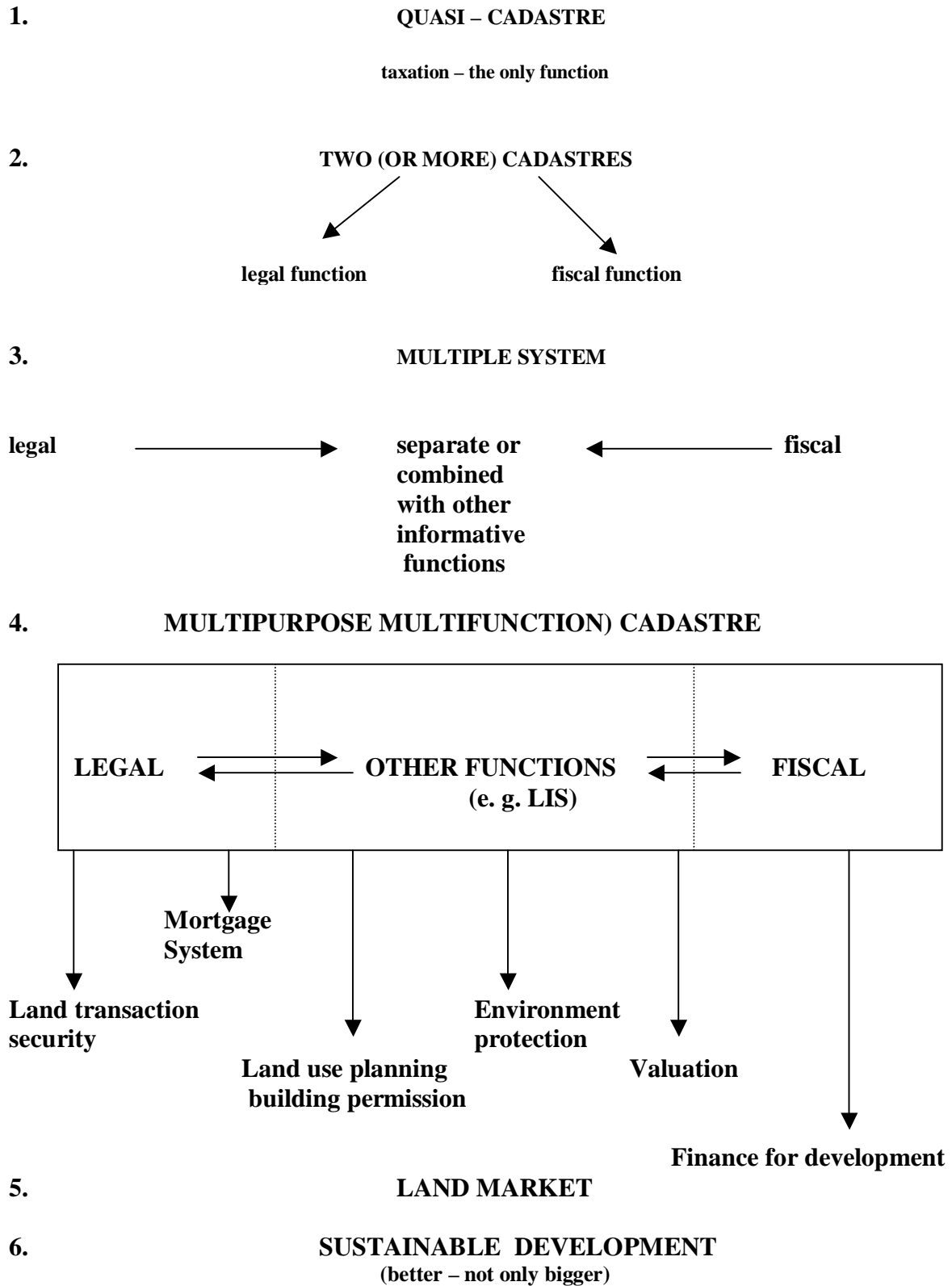


Fig. 2 Development of Cadastre and its Relation to the Surrounding World

5. HOW SUSTAINABLE DEVELOPMENT CAN EXIST IN MARKET ECONOMY

The concept of sustainable development has attracted a great deal of attention since it was coined and popularised in predominantly environmental context in the 1980's and 1990's by relevant United Nations' and others' initiatives, conferences and agenda.

A key feature has been the recognition of a long term vision which incorporates respect for the environmental limitations imposed by the physical constraints of the Earth: a modification of the conception of development to incorporate the recognition of limited resources.

This relates to the economy since development is an activity at the core of the economy, and these constraints may affect previously relatively unconstrained freedom to develop, including economically.

Development is also an activity in which political involvement has a vital interest as economic development, including its distribution, is a key factor in the relative attractions of different political philosophies.

Another strand of sustainability therefore relates more directly to the economic context. Land administration constitutes the legal framework and the related administrative structures dealing with real estate.

These are critical issues for the economy and for investment as they determine the core issues of ownership, use and security of title to land.

In the context of sustainable development, this legal framework and administrative structure acts as a control in the environmental/planning context, and, in the broader economic context, as a determinant of land market development, of land ownership and of planning/environmental policy. It has a critical impact on market values and thus on economic decision making as to the uses to which land should be put.

Sustainable development and land administration are closely linked and the adoption of the former concept as a philosophy therefore has major implication for the latter.

Real estate is likely to be by far the largest class of asset in most economies. Its efficient use and management must be one of the keys to successful economic development.

The reason for allowing market forces to determine the ownership, the user and, usually subject to planning/zoning and environmental considerations, the use of land and buildings, is that competition and the price mechanism will move the key economic resource of land and buildings towards the highest and economically most efficient use.

The functioning of the market must be straightforward and flexible to achieve this, not simply through buying and selling land or buildings. A sound understanding of how real estate is managed in a market economy environment and a positive approach to this management are also required.

Real estate, as a core capital asset, also needs to be considered in the context of investment.

Once real estate is held by entities in a market economy context, there are many reasons for its market valuation, because these values form the basis of decisions-. These reasons reflect the structure and dynamics of the real estate market, and the framework in which it operates.

The reasons for market valuations may be broadly divided into those that are to fulfil market requirements, such as those for sale, purchase, rent, insurance, mortgage, inheritance and divorce, and those that are to fulfil requirements laid down by statute, such as those for taxation and compulsory purchase compensation. (Munro-Furte, 1999).

6. SPECIAL CONSIDERATION - PRIVATE DEVELOPMENT OF LAND WITHIN A PUBLIC FRAMEWORK

If a developer has plans which meet the public criteria of the municipality, and is also willing to cover the related land costs in a fair way, the municipality can choose to facilitate private land development (with all financial risks sustained by the private parties involved), and to formulate the public framework before private development starts. The public framework can be formulated e.g. in all allocation plan, in public decisions of the Municipal Council, and/or in a contract with the private developer. It is also essential for the municipality to be absolutely clear about the public criteria to be met, so that the private developer knows precisely what the situation is. The local authority restricts itself to the formulation of the spatial dimension of the spatial plan at an early stage and puts its confidence in the professionalism and creativity of the developer. So long as developers act in good faith, bear the major burden of the risk and costs of their decisions and dealings themselves and keep to the public framework, conditions can be created for optimal results. It is important that in an extreme case a local authority is able to exact an appropriate recover of land costs to cut free riders off at the pass.

Also in this strategy scope-optimisation and agreements about value capturing are of strategic importance.

The local authority is mostly responsible by definition for the public dimension of spatial plans. This dimension ought in the first place to be laid down in an allocation plan, not at the end of the process, but at a relatively early stage. This plan will often be supplemented with criteria with respect to quality, differentiation, environment, costs, planning, and phasing. The public programme of requirements is determined in consultation with the long-term “stakeholders” *in* the area, and set out in a bid book.

A local authority can make a well considered choice in the specification of the process architecture from three strategies of land policy: acquisition of land in anticipation by the municipality followed by a bid by competing private consortia; a public private partnership with a sharing of financial risks; facilitating private land development within a public framework.

Strengthening the structuring function of local government and promoting competition require certain changes in land legislation and physical planning legislation:

- improvement of the municipal pre-exception law (rules) so that the preferential *rights* on the land market can no longer be circumnavigated by creative legal arrangements;
- establishing a land development plan/project including a land development permits.
- clarification of the public requirements which a municipality may prescribe in addition to the allocation plan: quality, differentiation, environmental issue, costs, planning in stages;
- defining an allocation plan in the framework of the physical planning system which may be used as public programme of requirements; (Priemus, 2002)

7. LAND TAXATION / CHARGING – WAYS AND RESULTS

Tax on land, or on build property, may be used as a way of achieving land-use planning objectives. Planning, in the sense of land-use planning, spatial planning, or town and country planning, is usually carried out using instruments such as controls over development (planning permission), public works, and public-private agreements.

It has often been suggested that these should be supplemented, even replaced, by financial instruments. Then desired development would be encouraged by grants and undesired development discouraged by levies. Land taxation could be used as such (financial)-instrument for land-use planning. The tax would raise the price of land (either absolutely or relative to the price of other goods and services), and the demand for it (either as a consumption good or as a factor of production) would fall. Presenting this “planning instrument”, it is desirable to estimate the effects to be expected: by how much would the use of land be ruled and controlled by a land tax of a certain amount?

Taxes can be levied on land or property for many purposes, and it is desirable to predict the effects of these taxes/charges on land use. This is particularly important with respect to taxes on land, for one of the reasons, why such taxes are proposed is that it has often been claimed. That tax on land is neutral: it has no effect on land prices and, therefore, no effect on land use.

One example of such a tax are the mentioned already various taxes on development gains when land is developed for a more profitable use. The prime purpose was to raise money for the exchequer, justified by the argument that the development gains were 'unearned' and were made possible only by public actions (in particular, by granting planning permission).

Another example is the property taxes which are levied to raise income for local government. There is a literature on this, much of it arguing that property taxes levied on the existing value of developed property (land + building) discourage redevelopment of old buildings and, thus, hasten the decline of older city centres. This opinion is often accompanied by the recommendation to replace that kind of property tax with a tax on land only and, moreover, on land in its potential (not existing) use. There has been much attention given to this in some countries.

When this recommendation is supported by arguments that such a tax (land value taxation) would have beneficial results on land use (such as rejuvenating existing cities and reducing

urban sprawl) it can be put under the first reason also - land taxes as a way of pursuing land-use planning.

Recently 'many countries' have introduced development charges / developer contributions / impact fees, or some such. Although the name varies, the principle is the same: developers have to pay towards the costs of the facilities or services which the development necessitates (or the developer may provide them directly). The aim is that facilities such as infrastructure, open space, perhaps even schools and libraries, which the developer would not normally provide, which would not have had to be provided if the development had not been built, and which will be used primarily by the users of the development, should not have to be paid for out of general taxation. They are required by development and they should be financed by the development.

The wide practical interest in land taxes and changes has led to a great variety in the way such taxes/charge are applied, or in the way it is proposed that they be applied. It is important to recognise this, as the way the tax/charge is levied can affect the land-use consequences. The crucial point is whether the land tax should be levied on *all* land (in one country) or selectively on just some types of land.

Another question is whenever the tax would be recurrent or one-off. The classical economists were thinking of a recurrent tax (e.g. paid every year), the amount to be based on the current market value of the land. Most property taxes are levied annually: site value rating would be as well. The taxes on development gains applied in Britain were one-off, based on the increase in land value caused by a change in development. Development charges, impact fees, etc. also are one-off. Recurrent taxes work differently from one-off taxes, mainly because the supplier of land (who pays the tax in the first place) is faced with different uncertainties. With a recurrent tax the supplier does not know how much will be payment each year, but knows that it will not be a huge, capitalised, sum. With a one-off tax, the amount to be paid is certain, but the supplier still has to forecast the future and in the light of this determine whether will be liable to pay the tax.

There is also the point concerning the timing of the tax/charge - when it has to be paid. A tax on development gains which is charged immediately the plan allows change to a higher use will induce the supplier to change the use as quickly as possible: the tax has an effect similar to site value rating. If the tax is levied on development gains only when they are realised, the supplier might decide to delay the change of use, perhaps indefinitely, or to wait until the time to develop it had become optimal before applying for planning permission.

The final point of importance is whether the tax/charge is levied on land, or on built property (land + building). In general terms, the method of analysis applicable to a tax on land is applicable to a tax on built property also. However, crating the effects of a tax, or charges, on built property is more complicated, because the tax/charge can affect the price and supply of the construction services input and/or of the land input.

There is much discussion about the extent to which charge on development is borne by the land and, thus, can be regarded as a tax on land.

Now we restrict ourselves for considering the effects of a tax on land (not on built).

There are some reasons for thinking that a tax on land could under certain circumstances very strongly influence prices and then, a tax on land could perhaps be used as a planning instrument.

The effect of a tax or charge on land can be expressed graphically as the supply curve shifting upwards by the amount of the tax. For a given price, less is supplied (because part of the income from sales is taxed away) or a higher price is necessary to keep the supply unchanged. Assuming that the demand is given, the market price will rise and the volume transacted will fall.

There are, then, two sorts of effect: on the market price and on the volume transacted. Both are affected by the price elasticity of the supply and of the demand. If the price elasticity of supply is zero, neither volume nor price is affected. If the price elasticity of supply is infinitely high, there is a volume effect and the price rises by the full amount of the tax. If the price elasticity of demand is zero, there is an effect on the market price but not on the volume. And if the price elasticity of demand is infinitely high, the situation is reversed.

The land market is far from being unregulated or free: in most countries there is a form of land-use planning which specifies the uses for which land in particular locations may be supplied. The form and content of the planning will affect the price elasticity of supply of land subjected to a tax or charge, also the possibilities for a supplier of land B to react to a tax or charge on land A.

If the policy is to apply land taxation in order to affect land use, then the aim is that the tax causes the price of the taxed land to change, which causes changes in the amount of the taxed land which is used. The bigger the “volume effect” of the tax, the more efficient is the tax as an instrument for planning.

If the policy is to levy charges so that the developer contributes to the external costs which the development makes necessary, or that some of the unearned development gains are taxed for the public purse, or if the policy is to raise income for local government by means of a property tax, then the intention is that the tax/charge has little effect on prices to the final user and on the amount of development. The charge should have a small “volume effect” (it should be “neutral”).

The more selective is the tax on land, the greater are the possibilities for the supplier to supply to another use, and the greater therefore is the price elasticity of supply. Some consequences: a tax levied on all building land is likely to be ineffective in reducing the conversion of land from open to developed, but has the potential to raise much income; a tax levied on - say - land used for car parking is likely to be effective in reducing the amount of land used for that purpose, and - conversely - will raise little income.

The stricter is the zoning of land by town planning, the smaller are the possibilities that the supplier can supply for, another use, and the smaller the price elasticity of supply. Some

consequences: if strict zoning is applied in order to achieve a given land-use change, and land is taxed as a complementary measure, the tax is likely to make little contribution to achieving that change: it will however raise quite a lot of money.

The smaller the development gains on the land to be taxed, the greater is the price elasticity of supply. The reason is that the tax will first be paid out of the economic rent, and if this is small, then the supplier will soon withdraw supply for that use. Some consequences: a tax on land for expensive housing will have smaller land-use effects than a tax on land for cheap housing; a tax on all building land will reduce the re-use for building of contaminated and derelict land more than it will reduce conversion of greenfield sites for development. (Needham, 2000)

8. FINAL THOUGHTS

It is not acceptable to say: A tax on land would have no effect on prices nor on land use. The effects of a tax on land are dependent on the price elasticity's of supply of, and demand for, that land.

This paper posed the question: is land tax an effective instrument for town planning? The answer has to be: yes only if it were to be applied very selectively (when the price elasticity of supply could be expected to be high) can one expect that it would be effective.

The second policy note could be: if charges on land are levied so as to raise income or to help finance infrastructure and other services, would this have much effect on land use? The answer is (yes but - only if the charges were to be applied very selectively (when the price elasticity of supply could be expected to be high) can one expect a large effect on land use. (Hopfer 2002).

An individual who is considering purchase of a land parcel is interested in two types of land information. First is the parcel-specific information which is required by lending agencies or government (appraisal, title search, etc. Second is the optional information which informs him as to the characteristics associated with the parcel. This may be site-specific information (sewage, drainage, soil credibility, etc.), or information specific to the public goods or externalities associated with the area in which the parcel is located (neighbourhood characteristics, public services, school district, etc – but first of all – the possible future use of this parcel. (Blaine, Randall, 1987).

Legal security of ownership with the clear identification of owners and what is owned, mechanisms for transferring rights in real estate and the availability of good land information to the public are important prerequisites for developing land markets. Sound land administration within appropriate institutional arrangements is essential for these developments. It is not necessarily the function of government to operate these institutional arrangements but it is the responsibility of government to ensure that they are in place and ultimately to be the guardian of the quality of service provided.

The land market is a mechanism whereby a more economical and efficient distribution of land can be achieved through the operation of market forces. It is thus an instrument of land

management policy as well as economics: the tenure, value and use of land are interconnected. Through the market, owners of land or buildings that are surplus to their needs can sell them to anyone who can use them more profitably or more efficiently. Thus his theory, over time, market mechanisms should ensure that land moves to its optimum use.

Mechanisms are also needed to allow the State to acquire land in the public interest. This applies both in urban and rural areas, for instance for infrastructure development such as the construction of new roads, for the provision of State services and to facilitate land assembly. The compulsory purchase of land must be at prices that are seen to be equitable and procedures for assessing compensation and for appeals against such assessments must be put in place. By monitoring the land market through the land administration system, the government can determine the current fair market price for land. (Dale 1997).

How is it then possible to comment on relations between cadastre and land use?

1. Cadastre contains the set of information necessary for planning use of land, according to the land market and market economy principles.
2. Land tax or another charge levied on land or built up property is in most cases based upon cadastral data (including property valuation).
3. The reasons for land taxation will be multiple characters – from simple money collection till stimulation or discouragement of given types of land use observing the principles of sustainable development. It affects as well land market selling/buying and developing different types of properties.
4. The results of items three and four are “measurable” (incorporated – by “national Cadastre”) and recorded by legal and fiscal cadastres i.e. they can create a new base for property taxation and charging.
5. Evaluation of complex results of described procedures and given circumstances – starting and ending in cadastral system, can be measured by:
 - land market activity factors
 - improvement of land use structure
 - achievement of other local - social and economical tasks, etc.

REFERENCES

- Blaine T.W., Randall A.: The “Avoided cost” Approach to Valuing Improvements in Land Information System (LIS) Services Underestimates the True Value. *The Economics of Land Information*, Baltimore, 1987.
- Dale P.: The importance of Land Administration in Achieving Political Objectives. 53-63, in: *Proceedings of The Second Plenary MOLA*, Warsaw, 1997.
- Hopfer A.: Theoretical and Practical Approach for Land Registration and LIS for Developing Countries; 91-98; in: *This is more than Geometry*; Delft 2002;
- Priemus H.: The Public Domestic 230- 246; in : a/a

Schlifgoarde v. P.: Our noisy Society 259-268. in: a/a
Munro – Faure P: Sustainable development and Land Administration Infrastructure Use Reforms: the Role of Land Markets and Land Valuation System – Agenda For Charge; 134-140; in: Proceedings of International Conference on Land Taxation and Cadastre Infrastructures for Sustainable Development. FIG Melbourne, Australia, 1999.
Muller A, Hopfer A. Urban Data Management Coming of Age, in: UDMS'89, Lisbon 1989
Needham B.: Land Taxation Development Charges and the Effects on Land Use. 31-40 in AESOP News, Spanned Education, 2000, 31-40.

CONTACTS

Prof. Dr. Andrzej J. Hopfer
29 c Ogrodowa St.
Kielpin
PL-05-092 Lomianki
POLAND
Tel. + 48 22 864 2355
Fax + 48 22 864 2355
E-mail: ahopfer@polan.com.pl