



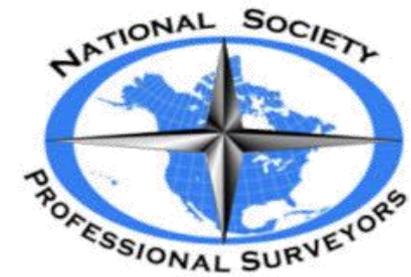
Federation of International
Surveyors



The World Bank



National Technical University
of Athens



National Society
Professional Surveyors

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The Cost of a Lack in Real Property Formalization on the Greek National Economy

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FIRST STAGE OF THIS STUDY

- *Analysis and gathering of socio economic data;*
- *Analysis of the scope, and parameters of the labor & real property markets;*
- *Analysis of the risk related socio political landscape of the real property market & national economy.*
- *Collection of the necessary market related data for each country.*

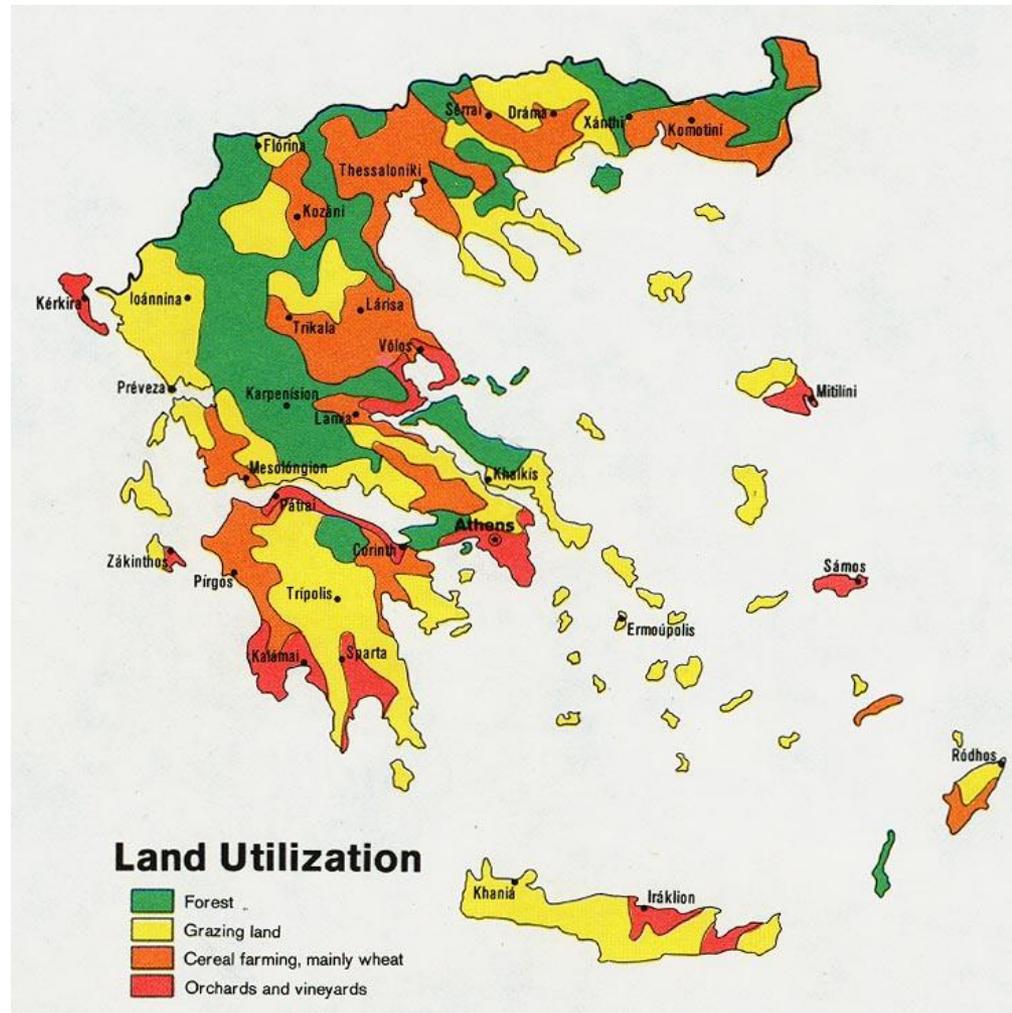
SECOND STAGE OF THIS STUDY

- *Development of a Property Market Status (Scorecard) Report for the selected countries.*
- *Analysis of the scale, location & types within the informal property market.*
- *Analysis of legal, social, economic and regulatory response to this informal market*

THIRD STAGE OF THIS STUDY

- *Estimation of the socio economic impact of the informal sector within the greater economy.*
- *Conclude to an annual economic impact of the informal sector on the national economy.*

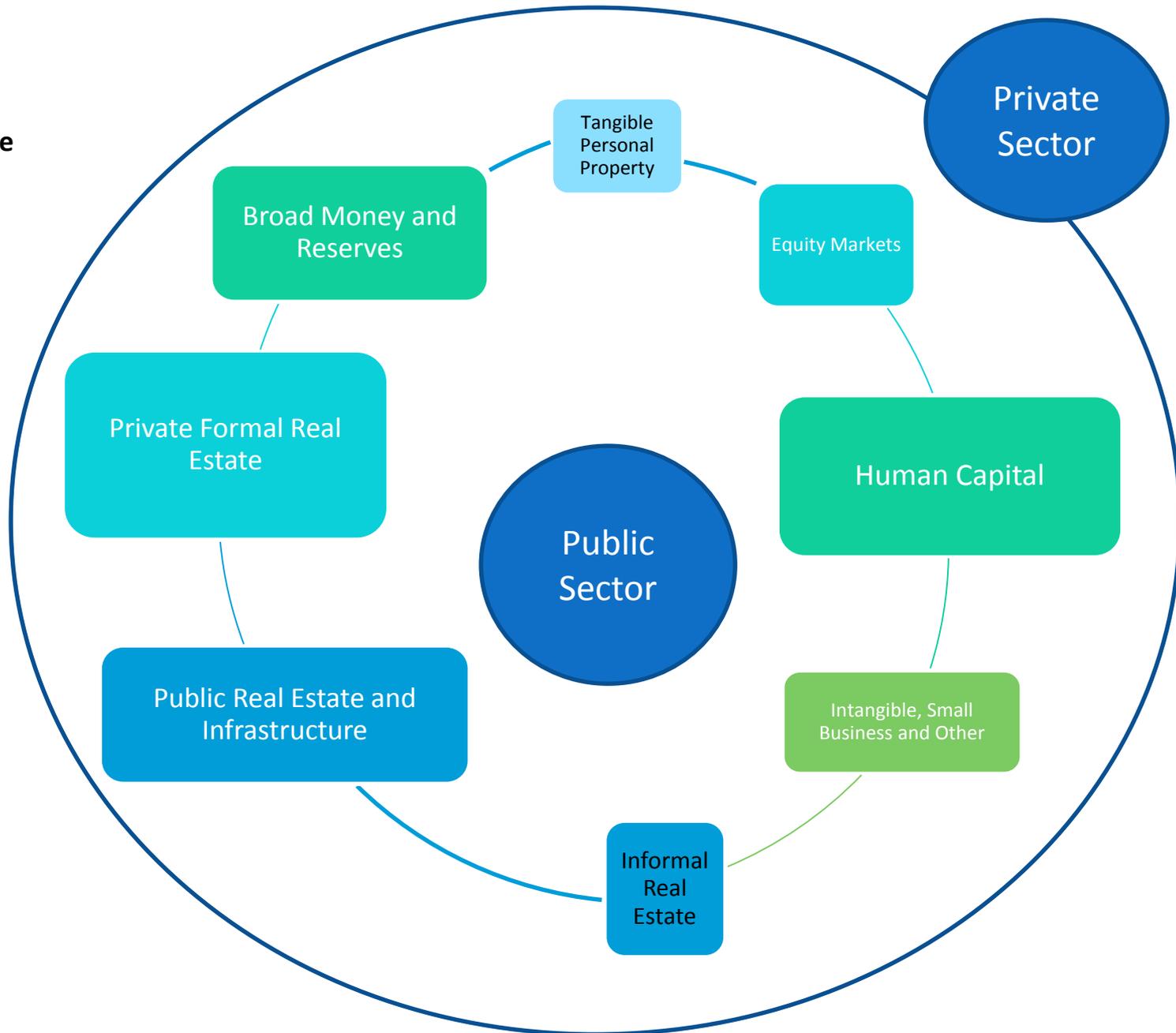
Case Study: Greece



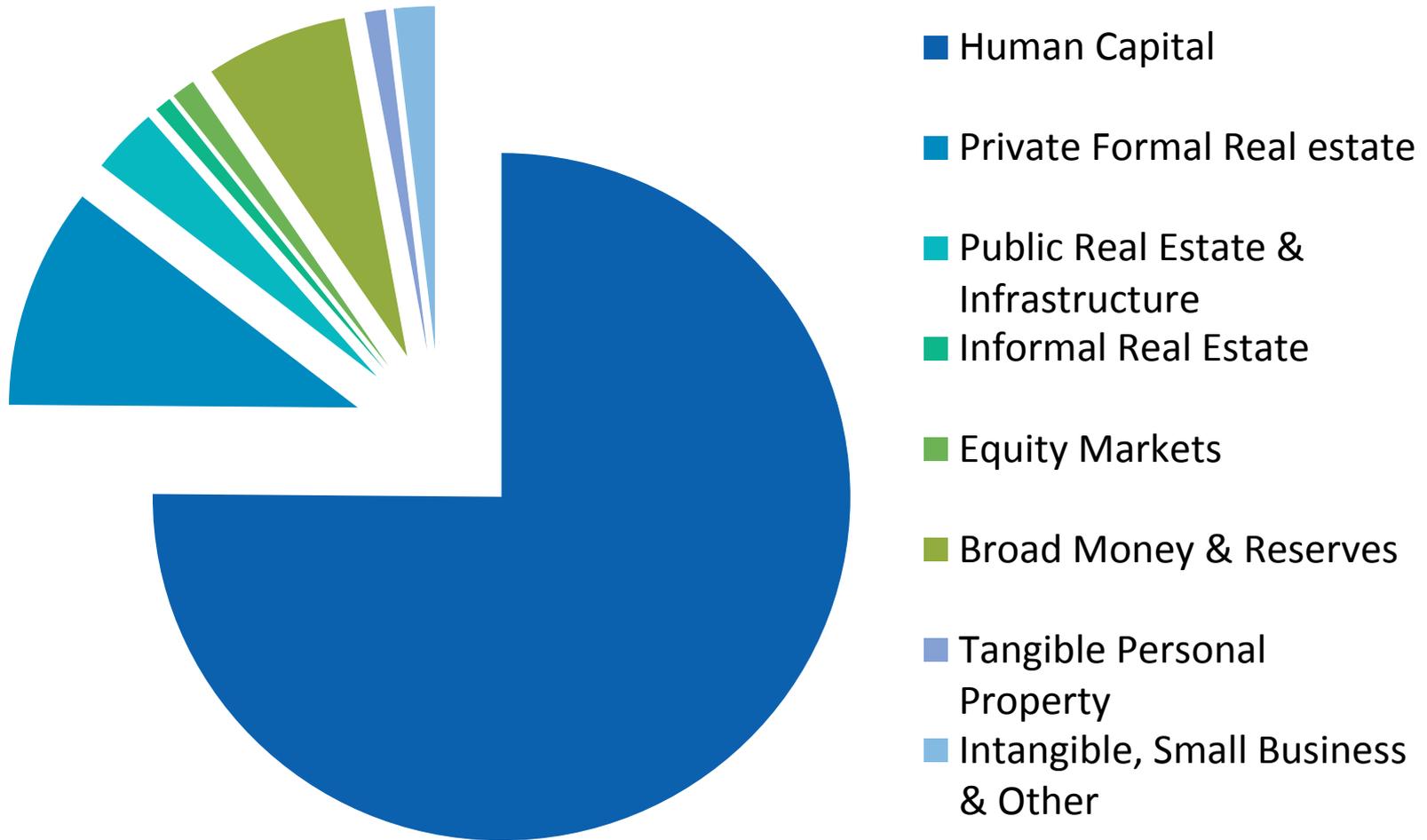
National Economic Value Components

External Factors:

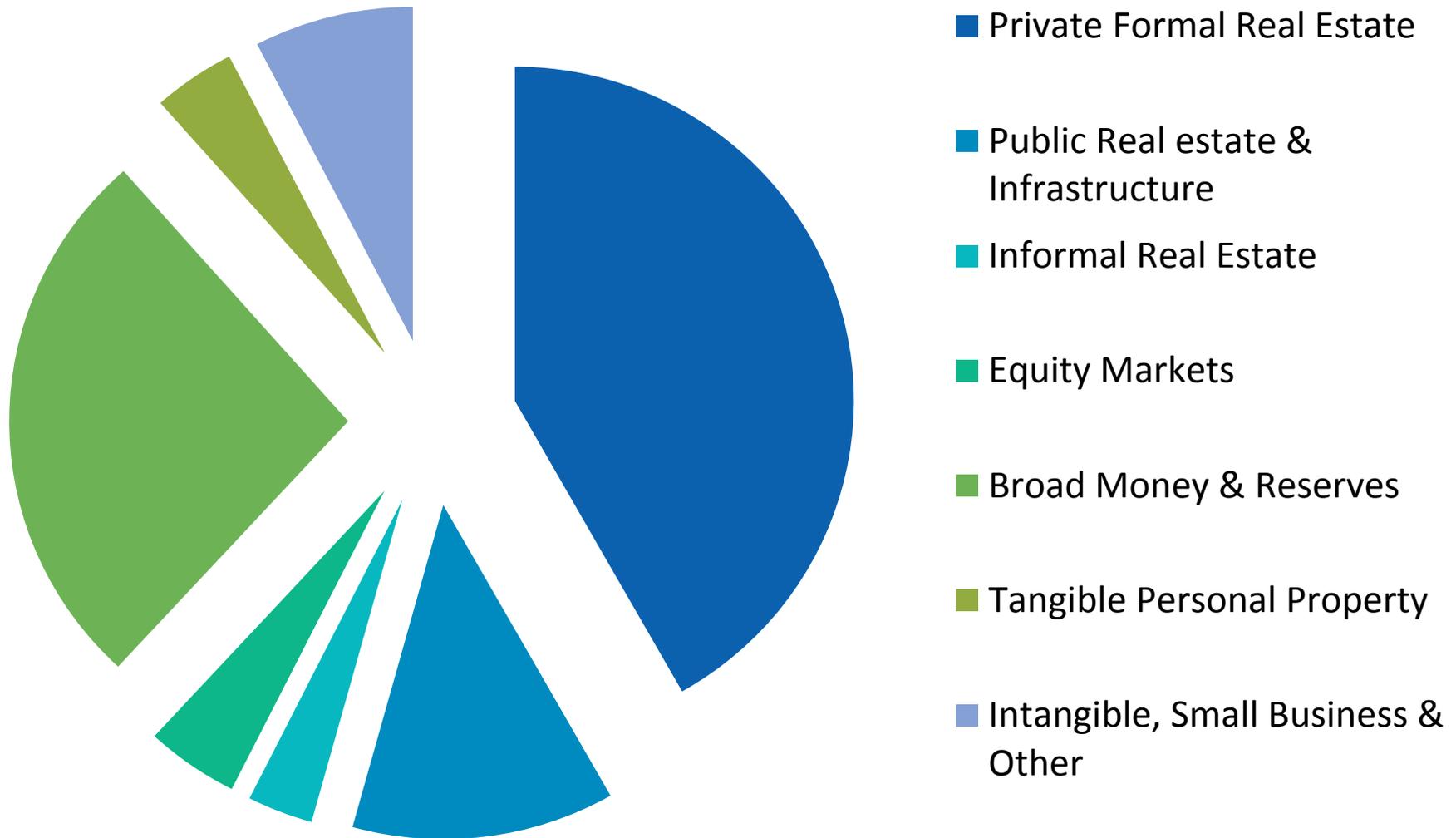
- Broad Market Influences
- National Antagonists
- National Protagonists
- Core Trade Markets



Greece National Asset Sectors



Greece National Asset Sectors (Excluding Human Capital)



Human Capital

Human Capital in Greece has been estimated with reliance upon a white paper titled “The Value of Human Capital Wealth” (Julian di Giovanni and Akito Matsumoto; 2012)

They assumed that the consumption to wealth ratio is constant. They exploit aggregate consumption data to recover total wealth, and then used household non-human capital wealth data to recover the value of human capital wealth as a residual.

Human Capital

First, the constant consumption to wealth ratio is;

$$W_t = kC_t$$

where k is a positive constant, t is a point in time, and C is consumption. Further, note that total wealth (W) is the sum of human and non-human capital wealth, which implies that

$$H_t = W_t - K_t = kC_t - K_t$$

where H_t and K_t are human and non-human capital, respectively, at the beginning of time t . These equations were the basis for all their human capital estimates.

The Consumption to Wealth Ratio

We study an infinitely lived representative agent framework to motivate cases when the consumption to wealth ratio is constant. This implies that our methodology is better thought of as an approximation for aggregate human capital rather than individual levels, although our methodology can potentially be used for the individual level.

The household maximizes the following objective function (Epstein and Zin, 1989, 1991; Weil, 1989):

$$U_t = \left\{ (1 - \beta)C_t^{1-1/\sigma} + \beta \left(E_t U_{t+1}^{1-\gamma} \right)^{\frac{1-1/\sigma}{1-\gamma}} \right\}^{\frac{1}{1-1/\sigma}}, \quad (1)$$

where C_t is consumption, σ is the elasticity of intertemporal substitution, and γ is the coefficient of relative risk aversion. If $\sigma = 1/\gamma$, then this Epstein-Zin-Weil utility function is simplified to a time-separable constant relative risk averse utility function.

The representative household's budget constraint is

$$W_{t+1} = R_{m,t+1}(W_t - C_t), \quad (2)$$

where W_t is total wealth at the beginning of period and $R_{m,t+1}$ is the gross simple return on total wealth from time t to $t + 1$. Log-linearizing (2) and taking conditional expectation yields

$$c_t - w_t = E_t \sum_{j=1}^{\infty} \rho^j (r_{m,t+j} - \Delta c_{t+j}) + \frac{\rho k}{1 - \rho}, \quad (3)$$

where lower cases denote the logarithm of the variable, $\rho = 1 - \exp \left\{ \ln \left(\frac{C}{W} \right) \right\} = \frac{W-C}{W}$ is the steady-state invested wealth (wealth after consumption, $W - C$) to total wealth (W) ratio, and $k = \ln \rho - \left(1 - \frac{1}{\rho} \right) \ln(1 - \rho)$.

The intertemporal Euler equation can be written as

$$E_t \left[\beta \left(\frac{C_{t+1}}{C_t} \right)^{-1/\sigma} R_{m,t+1} \right]^{\frac{1-\gamma}{1-1/\sigma}} = 1,$$

which [Campbell \(1993\)](#) shows can be approximated and rearranged as

$$E_t \Delta c_{t+1} = \mu_{m,t} + \sigma E_t r_{m,t+1}, \tag{4}$$

Combining equations (3) and (4) yields the following expression for the (log-linearized) consumption to wealth ratio:

$$\begin{aligned}
 c_t - w_t &= E_t \sum_{j=1}^{\infty} \rho^j (r_{m,t+j} - \Delta c_{t+j}) + \frac{\rho k}{1 - \rho} \\
 &= (1 - \sigma) E_t \sum_{j=1}^{\infty} \rho^j r_{m,t+j} - \sum_{j=1}^{\infty} \rho^j \mu_{m,t+j} + \frac{\rho k}{1 - \rho}.
 \end{aligned} \tag{5}$$

It can be shown that the consumption to wealth ratio is constant if either of the two following cases hold:

- **Case 1:** The elasticity of intertemporal substitution is unity ($\sigma = 1$), or
- **Case 2:** Asset returns are i.i.d..

When $\sigma = 1$ as in Case 1, the consumption to wealth ratio is constant as the first term drops out and $\mu_{m,t+j}$ becomes constant in (5). If returns are i.i.d., as in Case 2, then $\mu_{m,t}$ and $\sigma E_t r_{m,t+1}$ are constant, which implies that consumption follows a random walk with trend as studied by Hall (1978).

If either Case 1 or Case 2 hold then the constant ratio should be at its steady-state level, $1 - \rho$, at any t :

$$c_t - w_t = \ln(1 - \rho). \tag{6}$$

Human Capital

Summary Statistics of Human Capital to Total Wealth Ratios for OECD Country Sample: Annual Estimates

	Non-Durable Consumption			Total Consumption			
	H.C. ($\kappa=16.67$)	H.C. ($\kappa=20$)	H.C. ($\kappa=25$)	H.C. ($\kappa=16.67$)	H.C. ($\kappa=20$)	H.C. ($\kappa=25$)	L.C.
Austria	65.2 (3.56)	71.0 (2.96)	76.8 (2.37)	64.7 (3.78)	70.6 (3.15)	76.5 (2.52)	62.1 (2.39)
Canada	64.6 (1.28)	70.5 (1.07)	76.4 (0.85)	64.5 (1.19)	70.4 (0.99)	76.3 (0.79)	62.5 (1.76)
Czech Republic	82.9 (0.51)	85.8 (0.43)	88.6 (0.34)	82.9 (0.55)	85.7 (0.46)	88.6 (0.37)	55.2 (1.42)
Germany	– –	– –	– –	68.0 (2.12)	73.4 (1.77)	78.7 (1.42)	63.4 (2.52)
France	64.3 (5.50)	70.3 (4.58)	76.2 (3.67)	61.7 (6.91)	68.1 (5.76)	74.5 (4.61)	59.7 (2.48)
Italy	– –	– –	– –	52.6 (2.93)	60.5 (2.44)	68.4 (1.95)	52.5 (3.82)
Japan	52.6 (2.40)	60.5 (2.00)	68.4 (1.60)	52.5 (1.77)	60.4 (1.48)	68.3 (1.18)	63.0 (3.73)
Netherlands	64.8 (1.94)	70.7 (1.61)	76.5 (1.29)	63.9 (1.82)	69.9 (1.52)	75.9 (1.21)	61.5 (2.57)
United Kingdom	58.7 (4.45)	65.6 (3.71)	72.5 (2.97)	56.8 (4.25)	64.0 (3.54)	71.2 (2.83)	64.5 (3.54)
United States	69.3 (2.17)	74.4 (1.81)	79.5 (1.45)	69.1 (2.09)	74.3 (1.74)	79.4 (1.40)	65.6 (0.82)
Total	65.9 (8.70)	71.6 (7.25)	77.2 (5.80)	63.7 (8.96)	69.8 (7.47)	75.8 (5.97)	58.7 (8.54)

Notes: 'H.C.' is the HUMAN Capital-to Total-Wealth ration, and 'L.C.' is the Labor Compensation to National income Ratio. Means reported in first row and standard deviations in parentheses in second row. 'Total' estimates are based on pooling across countries and time. Human capital estimates based on nondurable or total consumption and net worth annual data from 1995-2007. Data sources are from the OECD.

National Asset Sectors

NATIONAL ASSET SECTOR VALUES JANUARY 2016 (IN UNITED STATES DOLLARS)					
			Greece	% share	% share
Human Capital			\$3,037,000,000,000	75.13%	excluded
Formal Private RE			\$420,000,000,000	10.39%	41.78%
Total Public RE			\$126,000,000,000	3.12%	12.53%
Informal RE			\$31,500,000,000	0.78%	3.13%
Corporate Equities			\$44,580,000,000	1.10%	4.43%
Broad Money and Government Reserves			\$267,330,000,000	6.61%	26.59%
Tangible Personal Property			\$39,500,000,000	0.98%	3.93%
Intangible, Small Business & Other			\$76,370,000,000	1.89%	7.60%
Total Estimated 1st Qtr. 2016 USD Value			\$4,042,280,000,000	100.00%	100.00%
Total Excluding Human Capital			\$1,005,280,000,000		

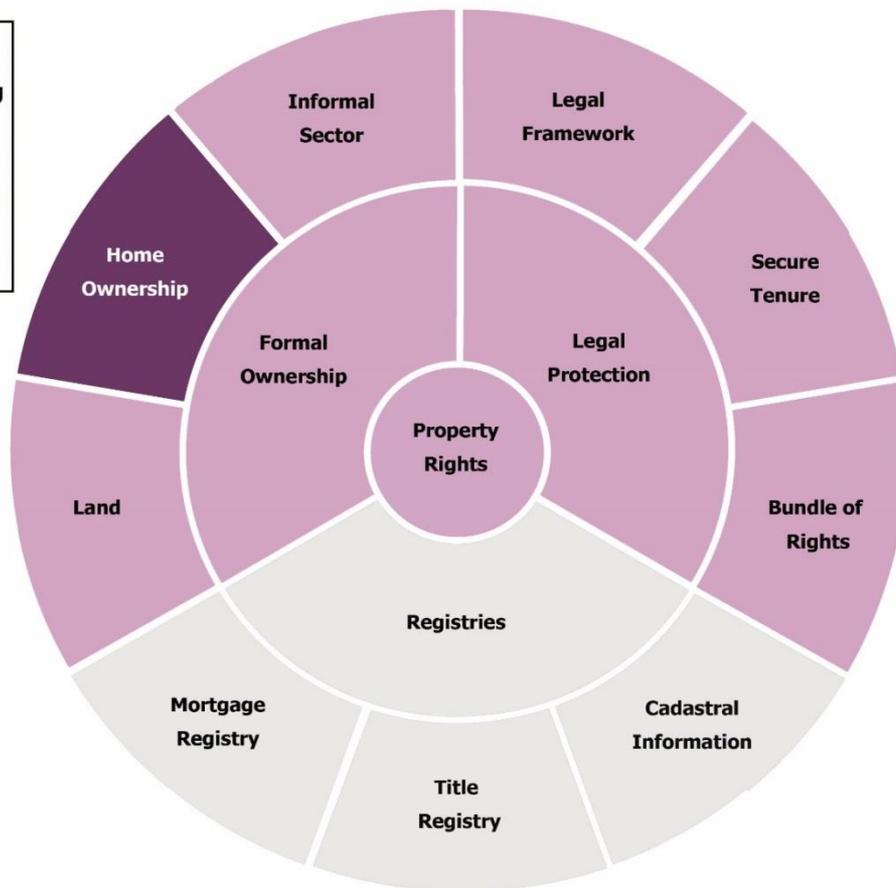
Property Market Foundation



Greece Property Market Scorecard – Greek Desktop Market Conditions January 2016

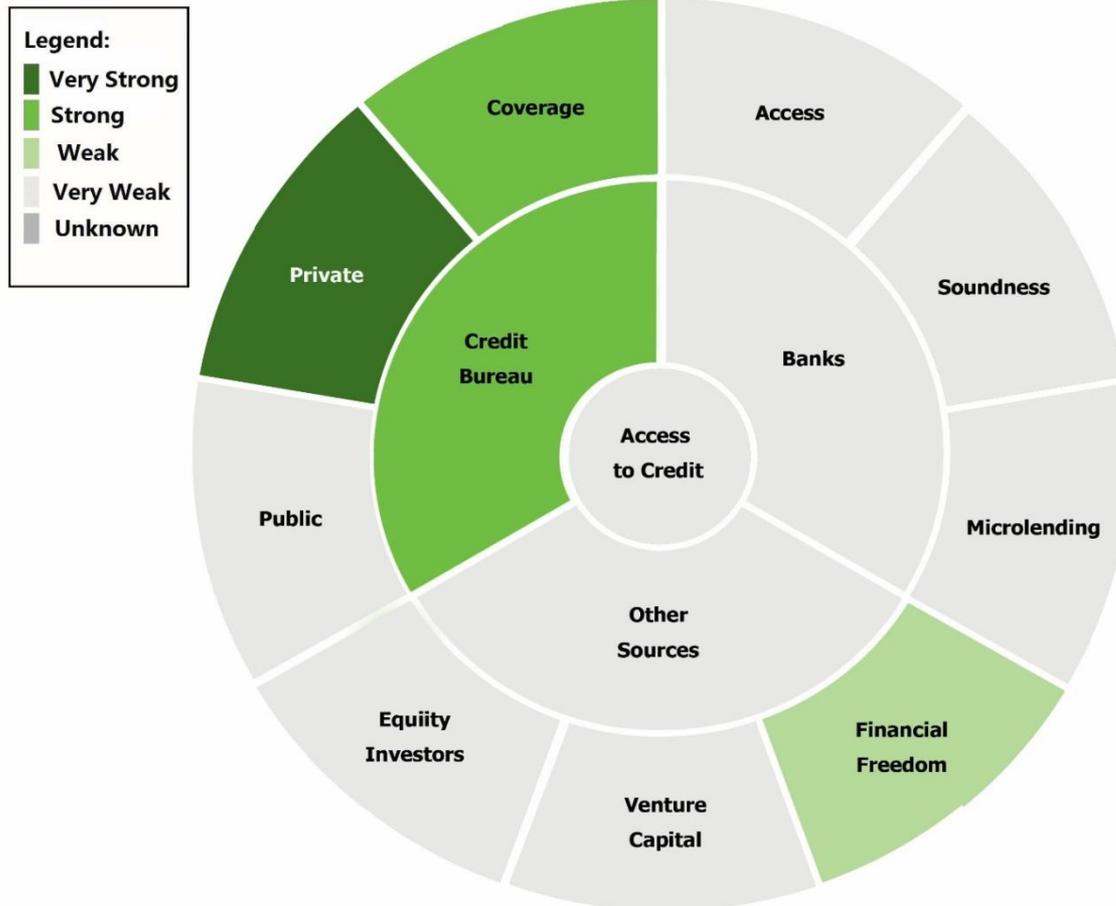


Property Rights



- Goal – Property rights that are legally protected, secure, recorded in a single, accurate, electronically assessable registry and that lead to high levels of formal ownership for all citizens

Access to Credit



- Goal – An efficient financial sector that allocates the resources saved by a nation’s citizens as well as those entering the economy from abroad to their most productive uses. It includes a sound, trustworthy and transparent banking sector, well-regulated securities exchanges, venture capital, and accessible credit information.

Effective Governance



- **Goal: A system of government in which citizens freely make political decisions by majority rule combined with guarantees of individual human rights and the rights of minorities.**
- **A government free of corruption and functioning efficiently enough to meet the needs of the people.**

Rational Dispute Resolution



- Goal: An efficient institutional framework that balances the rights of the public, owners, lenders and borrowers in the event of a dispute or loan default

Financial Transparency

Legend:

- Very Strong
- Strong
- Weak
- Very Weak
- Unknown



- Goal: A highly developed and transparent financial system including policies, institutions and trained and ethical professionals that contribute to effective financial intermediation and deep and broad access to capital and financial services

Appropriate Regulation



Goal: A comprehensive regulatory regime that is transparent, efficient, simple in its implementation and that leads to investments with the highest rate of return

Property Market Foundation



INFORMAL DEVELOPMENT IN GREECE

INFORMAL DEVELOPMENT SECTOR VALUES JANUARY 2016 (IN UNITED STATES DOLLARS)					
			<i>Greece</i>	% Informal	% Total
Non Planned Area -Legally Owned - Good Qual. - No Permit			\$7,875,000,000	25.00%	1.88%
Non Planned Area -Legally Owned - Violation of Permit			\$7,875,000,000	25.00%	1.88%
Planned Area - Illegal Multi Family Enclosure of Living Space			\$4,200,000,000	13.33%	1.00%
Planned Area - Illegal Subdivision for Multi Family Use			\$1,050,000,000	3.33%	0.25%
Slums Along Roads or Near Landfill Sites			\$2,100,000,000	6.67%	0.50%
Homes on Legally Owned Land Claimed by State (Forest etc.)			\$6,300,000,000	20.00%	1.50%
Good Qual. - Legally Owned - Illegally Subdivided Land			\$2,100,000,000	6.67%	0.50%
Total Estimated 1st Qtr. 2016 USD Value			\$31,500,000,000	100.00%	7.50%
Total of Private Formal Real Estate Value in Greece Qtr 1 2016			\$420,000,000,000		

ASSET SECTOR RETURN RATES

Summary Statistics of Human Capital and Other Asset Returns for the United States: Annual Estimates

	I. 1973–2007					
	<i>Nominal Return</i>		<i>Excess Return</i>		<i>Real Return</i>	
	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.
Total Wealth	10.70	2.17	4.06	3.05	6.66	1.58
Human Capital	11.01	2.76	4.37	3.34	6.96	1.92
Non-Human Capital	9.74	4.40	3.10	5.20	5.69	4.77
Housing	5.98	3.21	-0.66	5.01	1.93	3.42
Equity (CRSP)	12.46	16.32	5.82	16.01	8.41	16.68
Foreign Equity (MSCI)	10.51	19.29	3.87	19.48	6.46	19.69
Long-term Bond	8.45	10.17	1.81	9.77	4.41	11.01
1-Year T-note	6.63	3.04	–	–	2.58	2.21
	II. 1990–2007					
	<i>Nominal Return</i>		<i>Excess Return</i>		<i>Real Return</i>	
	Mean	St.Dev.	Mean	St.Dev.	Mean	St.Dev.
Total Wealth	9.01	0.78	4.26	2.36	6.65	1.24
Human Capital	9.07	1.26	4.33	2.15	6.72	1.44
Non-Human Capital	8.83	5.04	4.09	5.94	6.48	5.25
Housing	5.01	3.18	0.26	4.66	2.65	3.45
Equity (CRSP)	11.94	14.60	7.20	14.70	9.58	14.68
Foreign Equity (MSCI)	6.37	18.17	1.63	19.23	4.01	18.41
Long-term Bond	8.20	9.20	3.46	9.04	5.84	9.21
1-Year T-note	4.52	1.69	–	–	2.16	1.57

Notes: Total Wealth and human capital estimates based on nondurable consumption and net worth data, with $\kappa = 20$. All wealth growth rates are per capita. Data sources are NIPA, the Flow of Funds, MSCI, CRSP, HPI Classic.

GREEK NATIONAL ASSET SECTOR RETURNS

NATIONAL ASSET SECTOR VALUES & RETURNS JANUARY 2016 (IN UNITED STATES DOLLARS)

		<i>Greece</i>	Real Return	Annual Return
Human Capital		\$3,037,000,000,000	4.75%	\$144,257,500,000
Private Formal RE		\$420,000,000,000	3.50%	\$14,700,000,000
Total Public RE		\$126,000,000,000	1.75%	\$2,205,000,000
Informal RE		\$31,500,000,000	2.50%	\$787,500,000
Corporate Equities		\$44,580,000,000	5.00%	\$2,229,000,000
Broad Money and Government Reserves		\$267,330,000,000	3.35%	\$8,955,555,000
Tangible Personal Property		\$39,500,000,000	6.00%	\$2,370,000,000
Intangible, Small Business & Other		\$76,370,000,000	6.00%	\$4,582,200,000
Real Returns (1st Qtr. 2016 USD Values)		\$4,042,280,000,000	4.46%	\$180,086,755,000
Real Returns Excluding Human Capital		\$1,005,280,000,000	3.56%	\$35,829,255,000

LIMITED ABILITY TO SELL OR MORTGAGE

LIMITED ABILITY TO MORTGAGE OR SELL INFORMAL DEVELOPMENT (IN USD JAN. 16)

Asset Sector	% of Population Affected	% Loss in Efficiency	Economic Multiplier	Annual Return	Effect Years 1-5	Effect Years 6-10	Effect Years 11-25
Human Capital	15.00%	1.00%	1.50	\$144,257,500,000	\$64,915,875	\$162,289,688	\$324,579,375
Private Formal RE	15.00%	0.20%	1.50	\$14,700,000,000	\$1,323,000	\$3,307,500	\$6,615,000
Total Public RE	15.00%	0.20%	1.50	\$2,205,000,000	\$198,450	\$496,125	\$992,250
Informal RE	80.00%	40.00%	1.50	\$787,500,000	\$75,600,000	\$189,000,000	\$378,000,000
Corporate Equities	15.00%	2.00%	1.50	\$2,229,000,000	\$2,006,100	\$5,015,250	\$10,030,500
Broad Money and Government Reserve	15.00%	0.20%	1.50	\$8,955,555,000	\$806,000	\$2,015,000	\$4,030,000
Tangible Personal Property	15.00%	0.20%	1.50	\$2,370,000,000	\$1,066,500	\$533,250	
Intangible, Small Business & Other	15.00%	2.00%	1.50	\$4,582,200,000	\$4,123,980	\$10,309,950	\$20,619,900
Annual Totals Qtr 1 2016 (in Real United States Dollars)				\$180,086,755,000	\$150,039,905	\$372,966,762	\$744,867,025

HEALTH AND ENVIRONMENTAL COSTS

HEALTH AND ENVIRONMENTAL COST RELATED TO INFORMAL DEVELOPMENT (IN USD JAN. 16)							
Asset Sector	% of Population Affected	% Loss in Efficiency	Economic Multiplier	Annual Return	Effect Years 1-5	Effect Years 6-10	Effect Years 11-25
Human Capital	3.00%	0.75%	1.50	\$144,257,500,000	\$48,686,906	\$48,686,906	\$48,686,906
Private Formal RE	3.00%	0.05%	1.50	\$14,700,000,000	\$330,750	\$330,750	\$330,750
Total Public RE	3.00%	0.75%	1.50	\$2,205,000,000	\$744,188	\$744,188	\$744,188
Informal RE	3.00%	1.00%	1.50	\$787,500,000	\$354,375	\$354,375	\$354,375
Corporate Equities	3.00%	0.05%	1.50	\$2,229,000,000	\$50,153	\$50,153	\$50,153
Broad Money and Government Reserves	3.00%	0.05%	1.50	\$8,955,555,000	\$201,500	\$201,500	\$201,500
Tangible Personal Property	3.00%	0.05%	1.50	\$2,370,000,000	\$53,325	\$26,663	
Intangible, Small Business & Other	3.00%	0.05%	1.50	\$4,582,200,000	\$103,100	\$103,100	\$103,100
Annual Totals Qtr 1 2016 (in Real United States Dollars)				\$180,086,755,000	\$50,524,296	\$50,497,633	\$50,470,971

TAXATION, PLANNING, LABOR, RE RETURNS, INFRASTRUCTURE STRESS

TAXATION, PLANNING, LABOR ACCESS, INCREASED RE RETURNS & INFRASTRUCTURE STRESS IN INFORMAL DEVELOPMENT (IN USD JAN. 16)

Asset Sector	% of Population Affected	% Loss in Efficiency	Economic Multiplier	Annual Return	Effect Years 1-5	Effect Years 6-10	Effect Years 11-25
Human Capital	100.00%	0.235%	1.50	\$144,257,500,000	\$508,507,688	\$508,507,688	\$508,507,688
Private Formal RE	100.00%	-2.500%	1.50	\$14,700,000,000	-\$110,250,000	-\$275,625,000	-\$551,250,000
Total Public RE	100.00%	0.754%	1.50	\$2,205,000,000	\$24,938,550	\$24,938,550	\$24,938,550
Informal RE (Tax Increases)	100.00%	NAP	NAP	\$44,100,000,000	\$124,971,903	\$195,608,196	\$313,335,351
<i>Informal RE (Return Increases)</i>					\$226,800,000	\$567,000,000	\$1,134,000,000
Corporate Equities	100.00%	0.100%	1.50	\$2,229,000,000	\$3,343,500	\$3,343,500	\$3,343,500
Broad Money and Government Reserve	100.00%	0.124%	1.50	\$8,955,555,000	\$16,657,332	\$16,657,332	\$16,657,332
Tangible Personal Property	100.00%	0.124%	1.50	\$2,370,000,000	\$4,408,200	\$2,204,100	
Intangible, Small Business & Other	100.00%	0.385%	1.50	\$4,582,200,000	\$26,462,205	\$26,462,205	\$26,462,205
Annual Totals Qtr 1 2016 (in Real United States Dollars)					\$825,839,378	\$1,069,096,571	\$1,475,994,626
<i>(Informal RE on this chart is the total value for the asset sector, grossed up 40% for increased value after formalization)</i>							

TOTAL COST OF A LACK OF PROPERTY MARKET FORMALIZATION

TOTAL COST OF A LACK OF PROPERTY MARKET FORMALIZATION (IN USD JAN. 16)						
Asset Sector	Total Sector Value	Sector Return Rate	Annual Return	Annual Effect Years 1-5	Annual Effect Years 6-10	Annual Effect Years 11-25
Human Capital	\$3,037,000,000,000	4.75%	\$144,257,500,000	\$622,110,469	\$719,484,281	\$881,773,969
Private Formal RE	\$420,000,000,000	3.50%	\$14,700,000,000	-\$108,596,250	-\$271,986,750	-\$544,304,250
Total Public RE	\$126,000,000,000	1.75%	\$2,205,000,000	\$25,881,188	\$26,178,863	\$26,674,988
Informal RE (Tax Increases)	\$31,500,000,000	2.50%	\$787,500,000	\$200,926,278	\$384,962,571	\$691,689,726
Informal RE (Return Increases)				\$226,800,000	\$567,000,000	\$1,134,000,000
Corporate Equities	\$44,580,000,000	5.00%	\$2,229,000,000	\$5,399,753	\$8,408,903	\$13,424,153
Broad Money and Government Reserves	\$267,330,000,000	3.35%	\$8,955,555,000	\$17,664,832	\$18,873,832	\$20,888,832
Tangible Personal Property	\$39,500,000,000	6.00%	\$2,370,000,000	\$5,528,025	\$2,764,013	\$0
Intangible, Small Business & Other	\$76,370,000,000	6.00%	\$4,582,200,000	\$30,689,285	\$36,875,255	\$47,185,205
Annual Totals Qtr 1 2016 (in Real USD)	\$4,042,280,000,000		\$180,086,755,000	\$1,026,403,578	\$1,492,560,966	\$2,271,332,621
25-Yr NPV (4.46% Discount Rate)	\$25,595,852,970			\$4,510,914,777	\$5,273,858,060	\$15,811,080,133

Extended Analysis & Conclusions

- The Cost of a Lack of Property Market Formalization for Years 1-5 is \pm \$1 Billion “Real” USD per year.
- The Cost of a Lack of Property Market Formalization for Years 6-10 is \pm \$1.5 Billion “Real” USD per year.
- The Cost of a Lack of Property Market Formalization for Years 11-25 is \pm \$2.3 Billion “Real” USD per year.
- ***The Current Net Present Value (4.46% DR) of a Lack of Property Market Formalization is \pm \$25.6 Billion USD***

Thank you!

“A good legal property system is a medium that allows us to understand each other, make connections, and synthesize knowledge about our assets to enhance our productivity”
- Hernando de Soto

