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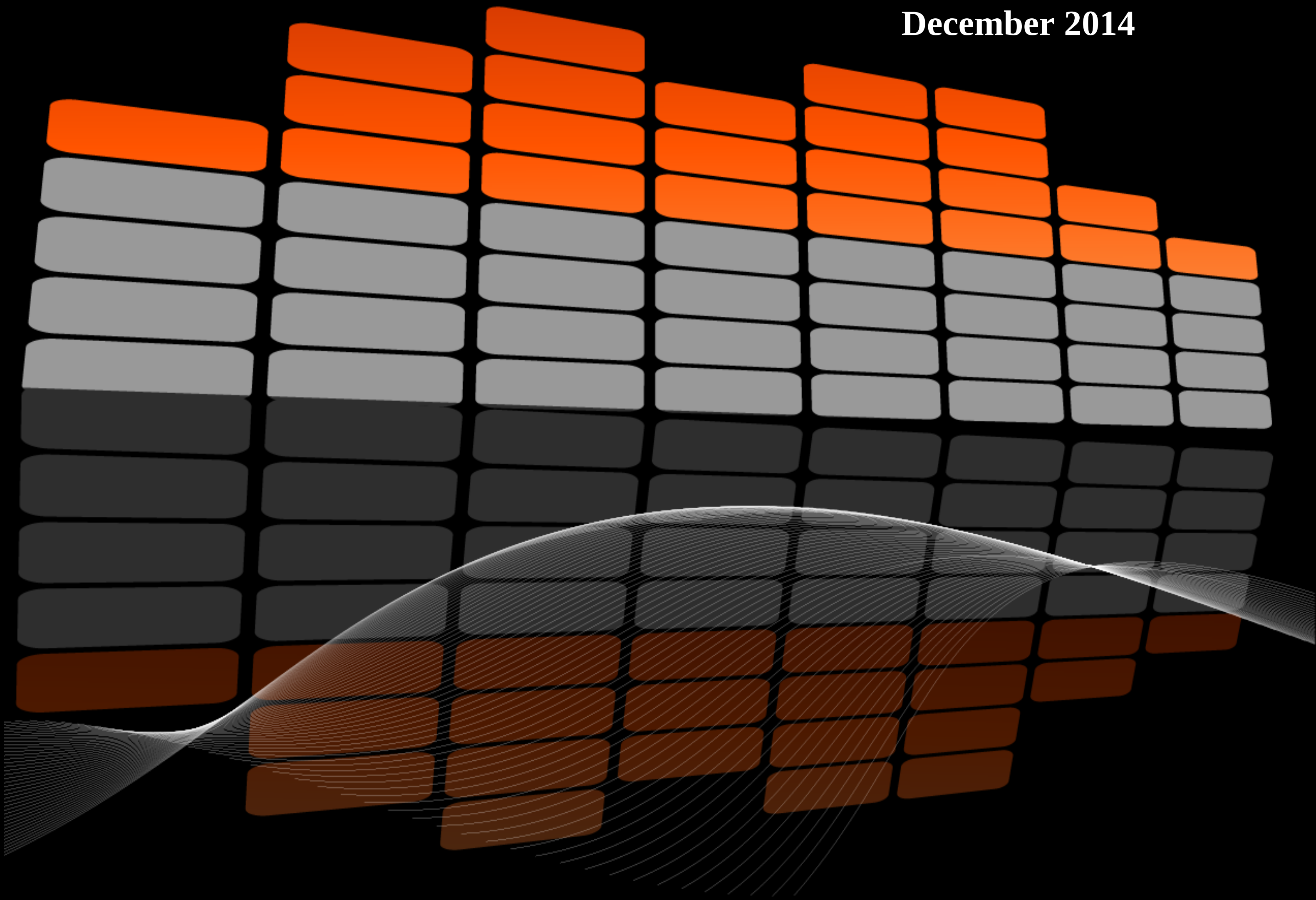

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Management of Pension Funds: the Case of Portugal

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Abstract **– The concern with the long term viability of most of existing government-operated pension systems, due to demographic changes, have led to various proposals for pensions reform, many of which have already been put into action. However, pension reform remains a highly controversial issue due to its complexity. This article brings attention to the management performance issue concerning funded systems. Detailed evidence and discussion is given to both investment performance results of public pension reserve funds, within the Social Security system, and to private pension funds in Portugal. Policy implications are also analysed and discussed.**

Keywords - *Social security system, partially funded system, private pensions, investment performance, Portugal.*

1. Introduction

One of the central questions regarding the financing of pensions concerns the existence, or non-existence, of prior accumulation. This may take the form of obligatory State social insurance or, alternatively, of a private insurance scheme, which is either obligatory or optional. Either form must guarantee the payment of the pensions required.

Two methods for the financing of benefits are available: the pure distribution system[1], where current contributions cover the payments of current pension obligations, and the pure capitalization system[2], where a reserve is created previously for the purpose of attaining the defined benefit which it is intended to guarantee, contributions being calculated actuarially. Capitalization comprises the investment, at compound interest rates, of the total of premiums or contributions received, net of management and acquisition charges, in order to obtain, by a given date, the capital necessary to distribute as life pensions. These mechanisms or technical instruments cannot be defined as being uniquely public or private. State capitalization can exist alongside private pension distribution and, conversely, private capitalization alongside State distribution.

The debate about the need, if any, for pension reform, initiated by the concern for long term financial viability of existing government-operated pension systems (Bongaarts, 2004), must highlight their basic principles and the various aspects related to efficiency, distribution, and stability (Lindbeck and Persson, 2003; Bonoli and Palier, 2007; Börsch-Supan, 2007; Lewis and Lloyd-Sherlock, 2009; Cutler. and Waine, 2013). Hence, the move from an unfunded (pay-as-you-go) and non-actuarial system, to a more actuarial system, or even to a fully funded system, requires considerable discussion about these aspects, as well as risk and risk sharing issues, administrative costs (CBO, 2004), and investment performance (Logue and Rader, 1998; Thomas and Tonks, 2001; Coggburn and Reddick, 2007). In addition, the choice between public and private management of pension funds is crucial (World Bank, 1994, 2001). Eventually, the design of a balanced pension system is desirable (Ostaszewski, 2012b). Recently, an agenda for making pensions adequate and sustainable in the long term was proposed (by the European Commission, in 2012).

Many OECD countries, including Portugal, have built up public pension reserves to help pay for State pensions. In these countries, in 2009, public pension reserves were worth nearly 20% of GDP (OCDE 2011). On the other hand, private pension arrangements have been growing in importance in recent years, as pension reforms have reduced public pension entitlements. In 2009, OECD pension fund assets reached USD 16.8 trillion. This trend is aligned with the idea that the retirement systems should be supported by four pillars or tiers (Dixon, 2008; Ostaszewski, 2012a).

This paper analyses the investment performance of public and privately managed pension funds in Portugal. Both are affected by the financial crisis, which has simultaneously led to decreasing levels of interest rates, real economic growth rates and rates of return, since the 1980s (Ostaszewski, 2012a). The next section describes the issues concerning public pension reserve funds. Following this, the private pension funds market is analysed, as well as the comparison of investment performance results. Conclusions are then presented.

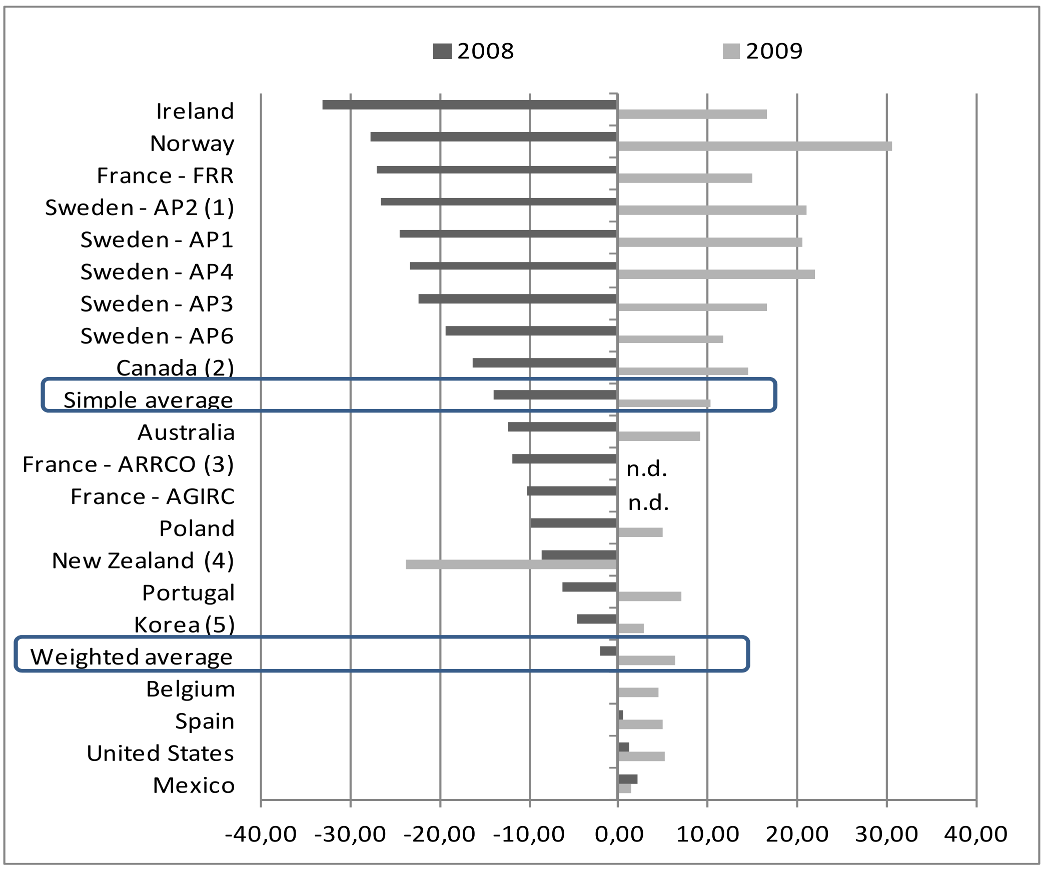
[1] Or pay-as-you-go system.

[2] Or fully funded system.

2. Public pension reserve funds

Public pension reserve funds (PPRFs) are reserves established by governments to meet public pension expenditure[3]. Therefore, they are expected to play a major role in the future financing of public pension systems, alleviating the impact of population ageing (Coleman, 2006). However, due attention to PPRFs investments and impact on financial markets has not been given. Indeed, one might ask what information is available to assess the investing strategies of PPRFs in order to understand investments in Citigroup, Morgan Stanley, and Merrill Lynch, during the 2008 financial crisis, by several sovereign wealth funds where PPRFs are included (Gintschel and Scherer, 2008; Ainina and Mohan, 2010). In addition, good pension fund governance is needed to value creation (Clark and Urwin, 2008; Truman, 2008).

By the end of 2009, the total amounts of PPRFs assets were equivalent to USD 4.6 trillion for the 17 OECD countries (OECD, 2011). The largest reserve was held by the US Social Security Trust Fund, at USD 2.5 trillion, accounting for 54.7% of total OECD assets, although these assets consist of non-tradable special bonds issued by the US Treasury to the Social Security Trust[4]. Japan's government pension investment fund was second, with USD 1.3 trillion, representing 28.2% of the OECD total.



1. There are five Swedish National Pension Funds (AP1-AP4 and AP6).

2. 2009 data refers to fiscal year 2010, ending March 31, 2010.

3. AGIRC and ARRCO are unfunded mandatory supplementary plans for white-collar and blue-collar workers respectively, with reserves. More information on these plans can be found in the OECD Private Pensions Outlook 2008.

4. Data refers to June of each year.

5. 2009 data refers to the period January-March 2010.

Source: Adapted from OECD Global Pension Statistics.

Figure 1. PPRFs' real net investment return in selected OECD countries, 2008-2009 (%)

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Countries such as Korea, Sweden and Canada had also accumulated large reserves, respectively accounting for 4.7%, 2.3% and 2.3% of the total.

On the other hand, in 2009, on average, PPRF assets accounted for 18.4% of GDP in the OECD area. The Swedish AP funds registered the highest ratio, with 27.2% of GDP. Other countries with a significant ratio included Korea, with 26.1%, and Japan, with 23.2%.

Regarding asset allocation of public pension reserve funds, bonds and equities were the predominant asset classes within PPRF portfolios at the end of 2009. In some reserve funds, there was a strong equity bias, which reflects their long-term investment outlook and a generally greater investment autonomy. For example, in 2009, Ireland's national pensions reserve fund invested 72.0% of its assets in equities and 5.5% in bonds, whilst the figures for Norway were respectively 61.4% and 33.9%, for Sweden (AP3 fund) 50.2% and 35.6%, and 44.2% and 23.7% for Australia. On the other hand, reserve funds in Japan, Portugal, Poland and Mexico invested much more in bonds than equities in 2009. The Belgian, Spanish and US PPRFs, the extreme cases, are by law, fully invested in government bonds (except for the case of the Spanish fund, where 3.3% of total assets are invested in cash and deposits).

Furthermore, some PPRFs also started to invest in real estate and non-traditional asset classes, such as private equity and hedge funds. The funds with the highest allocation of private equity and hedge funds were New Zealand (26.7% of total in 2009), Canada (17.1%) and Australia (12.7%).

Investment performance is a most important issue in relation to public pension reserve funds. Generally, in 2009, public pension reserve funds regained ground lost during the 2008 crisis. However, the impact of the crisis on PPRFs' investment returns varies greatly across countries, as some funds experienced strong negative returns in 2008 of more than –20% (Ireland, Norway, the French pension reserve fund and Sweden), while others had positive returns (Belgium, Spain, the United States and Mexico) [5] . At the end of 2009, all funds for which data is available, experienced positive, real net investment returns, ranging from 1.3% in Mexico, to 30.7% in Norway. On average, investment returns were slightly negative in 2008, and positive in 2009 (when weighted by total assets), increasing from –2.0% in 2008, to 6.2% in 2009. By the end of 2009, the total amount of PPRF assets was on average 7.3% higher than at the end of 2008, and 13.9% higher than in December 2007.

Taking into account the burden of future generations, the Portuguese government introduced partial public capitalisation in 1989, with the creation of a public pension reserve fund[6]. Since then, the surplus of the providential system is transferred to this fund, although not on a regular basis, for investment in financial markets, which are managed under the principles of capitalization[7]. Thus, the public Social Security system is financed by the pay-as-you-go system, as well as the reserve fund. The idea is that return on investments will be sufficient to reinforce the financial reserves and help absorb the expected rising costs created by the fact that more and more members of the active population are entering retirement, plus the phenomenon of high long term unemployment.

The Social Security Law of 2000 explicitly takes into account and reinforces partial capitalisation, stipulating that between two and four percent of employees' contributions must be transferred into the reserve fund (employee contribution rate is 11% of gross remuneration), up to the point where expenditure on pensions is guaranteed for a minimum period of two years. This measure is in addition to the annual surplus in the providential system, and was designed to ensure the financial viability (sustainability) of the Social Security system. Silva et al. (2004) analyse the accounts of the providential system, as well as its impact on the portfolio of the public pension reserve fund. They conducted a simulation of the fund's assets which allowed them to conclude that the fund's assets reach their peak of 12,032.502 million euros in 2012 and that the fund will have to be mobilized for the first time in 2011, and will run out in 2026. More recently, the new Social Security Law of 2007 establishes that the complementary system includes a public regime of capitalization[8] , in addition to the existent complementary regimes of an individual and collective nature[9].

The partial pre-funding of the otherwise pay-as-you-go system by the establishment and development of a public pension reserve fund was subject to an analysis of investment controls, in order to evaluate the sound management of this type of fund (Yermo, 2007, 2008). Comparison with private pension plans

[5] Real (after inflation) returns are calculated using national valuation methodologies.

[6] Or Social Security Trust Fund (Fundo de Estabilização Financeira da Segurança Social - FEFSS).

[7] This pension fund mainly invests the surpluses of employee and employer contributions over current payouts. Hence, this is a Social Security reserve funds or SSRFs (Truman, 2008).

[8] In February 2008 retirement certificates (C*ertificados de Reforma*) were established. They are for voluntary, individual contributions. In December 2011 their reference value was 1.08710 € and the fund value was 19,990,439.64 €. The contribution rate is between 2% and 4% of employees' salary. At the end of 2009, there were 7425 contributors.

[9] These include professional and individual private pension plans.

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is unavoidable. The following section describes the Portuguese public pension reserve fund.

1.1 The Portuguese public pension reserve fund

The public pension reserve fund is managed by a State institution, the IGFCSS[10]. The investment policy followed by the management board of IGFCSS must guarantee preservation of capital, which necessitates a rate of growth at least equal to the expected inflation rate for the Euro Zone. The public pension reserve fund is considered an instrument of public capitalisation.

At the end of the financial year of 2009, the FEFSS' assets stood at 9,407.66 million euros, corresponding to 97.8% of annual pension benefits expenditure (or 11.74 months, which is still inferior to the objective of two years), representing 5.7% of GDP. Portuguese State bonds constitute the greatest proportion of investments, reflecting the legal obligation that not less than 50% of assets must be invested in government bonds. Equities accounted for 17.13% of the portfolio, although the legal maximum is set at 25%.

As from 2002, a new eligible asset class was approved - the strategic reserve, with a cap of 5% of total assets. By 2009 it represented 2.27% of the portfolio.

2.1 The profitability of the Portuguese public pension reserve fund portfolio

Investments results for the period 2000-2009 are generally positive (Table 1).

Over this ten year period, assets under management have significantly grown, displaying an average nominal rate of return of 4.07%, and an average real rate of return of 1.96%. The growing weight of equities in portfolio composition has meant that performance has been adversely affected by the financial crises of 2000-2002 and 2008 onwards (Franzen, 2010).

All the same, the management model of FEFSS won the Investments & Pension Europe Award for the best pension fund in Portugal in 2006 and in 2009.

In 2009 a new strategic management policy was established, which includes risk management indexation to EFFAS Portugal and transition to a dynamical benchmark.

3. Private pensions funds

Private pension arrangements are increasingly important for the provision of retirement income, as pension reforms have reduced public pension entitlements. Private pensions are mandatory and voluntary private pensions as well as occupational and personal private pensions (OECD, 2011). In 2009 the United States had the largest pension fund market within OECD member countries, with assets worth USD 9.6 trillion, representing 57.1% of the total.

Table 1. Investments returns on PPRF in Portugal, 2000-2009, %

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average 2000-2009
Nominal rate of return	4.11	3.28	2.51	6.50	5.90	6.76	5.18	4.08	-3.86	6.25	4.07
Real rate of return	1.97	0.96	0.21	4.45	3.46	4.44	3.20	0.98	-5.35	5.28	1.96

Source: IGFCSS Annual Reports

[10] IGFCSS – Instituto de Gestão de Fundos de Capitalização da Segurança Social, approved in 1999.

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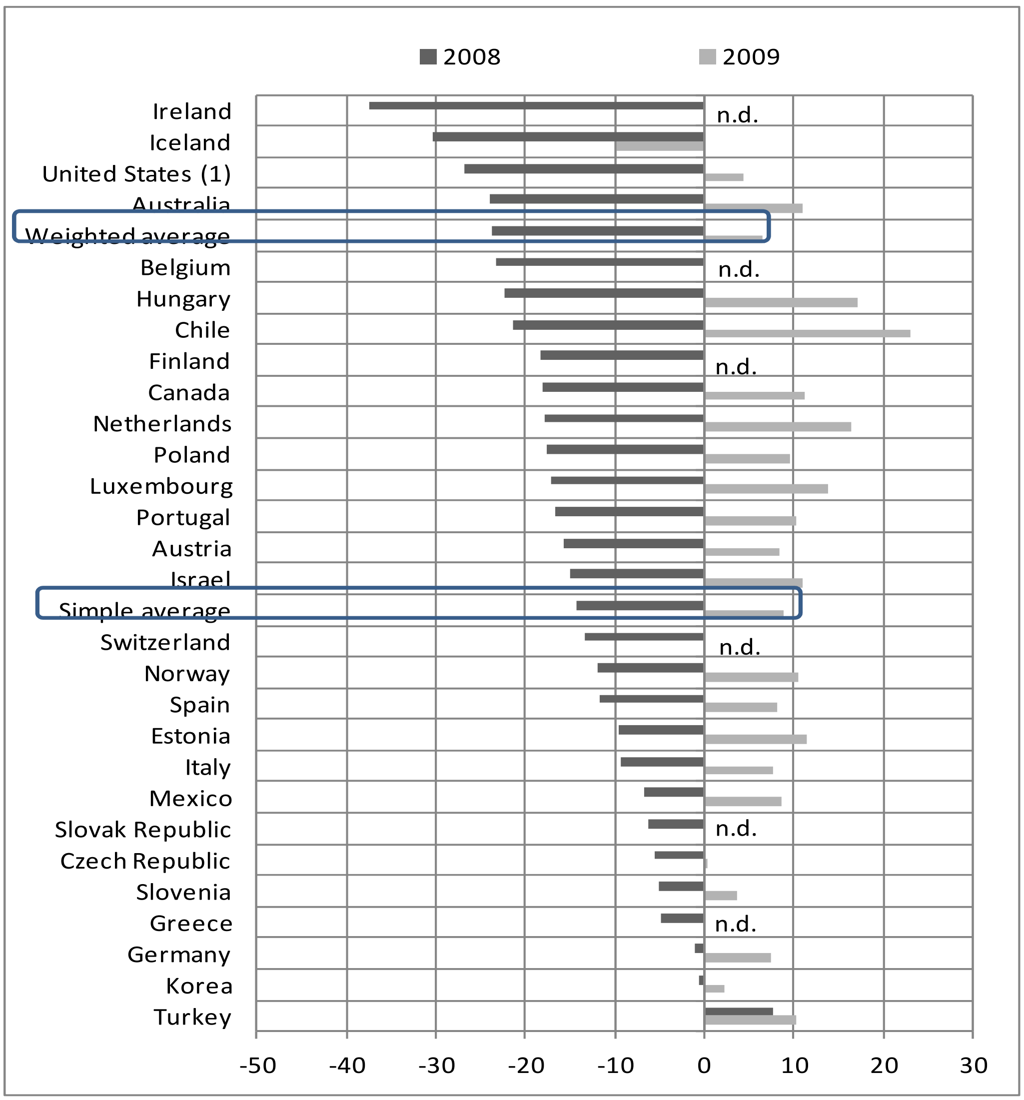
Several other OECD countries have large pension fund systems. In 2009, the United Kingdom had assets worth USD 1.6 trillion, accounting for a 9.5% share of the OECD pension fund market. Japan had USD 1.0 trillion, representing 6.2% of the total. The Netherlands, USD 1.0 trillion (6.1%); Australia, USD 0.8 trillion (4.8%); and Canada, USD 0.8 trillion (4.8%).

In 2009, three countries registered asset-to-GDP ratios higher than 100%. The Netherlands (129.8%), Iceland (118.3%) and Switzerland (101.2%). In addition to these countries, Australia (82.3%), the United Kingdom (73.0%) and the United States (67.6%) exceeded the OECD weighted average asset-to-GDP ratio of 67.6%. In such countries, funded pensions have been in place for a long time, and, with the exception of the United Kingdom and the United States, have mandatory or quasi-mandatory private pension systems. Pension fund assets were of varying importance relative to GDP in the other countries. Almost 40% of the countries (13 out of 34) had asset-to-GDP ratios above 20%.

Some countries have introduced mandatory funded pension systems in recent years. Chile has the longest



1. 2009 data refers to the period January-June 2009.

Source: Adapted from OECD Global Pension Statistics.

Figure 2. Pension funds' real net investment return in selected OECD countries, 2008-2009 (%)

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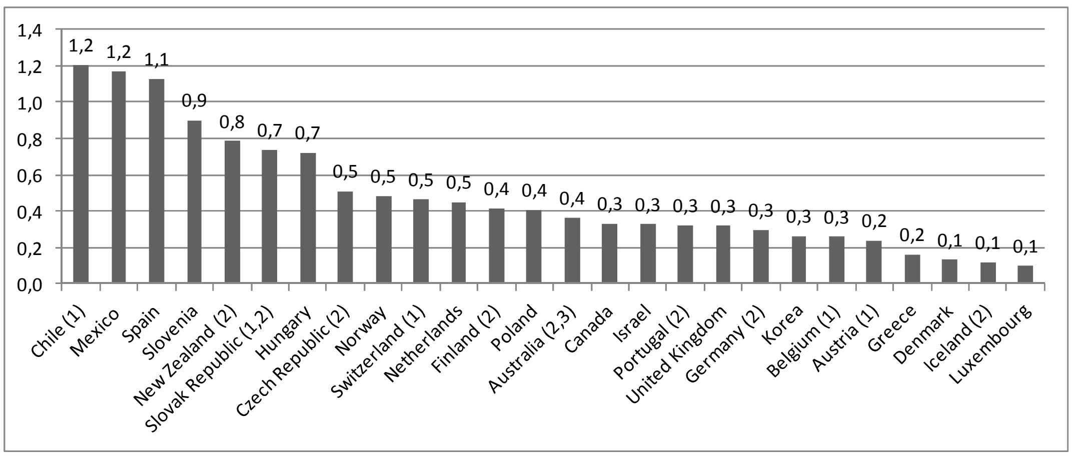
history and has accumulated assets close to the OECD average (65.1%). Hungary, Mexico, Poland and the Slovak Republic also introduced mandatory private pensions in the late 1990s and early 2000s. Assets have grown rapidly since that point, reaching around 13% of GDP in Hungary and Poland.

At the end of 2009, bonds and equities were the most common kind of investment in pension fund portfolios. Proportions of equities and bonds vary considerably across countries but there is a greater preference for bonds in general.

On average, pension funds experienced a positive investment rate of return of 6.5% in real terms up to the end of 2009, recovering from a negative average return of 22.5% in real terms in 2008 (Figure 2). The best performing pension funds amongst OECD countries in 2009 were Chile (23%), Hungary (17%), The Netherlands (16%) and Luxembourg (14%). In fact, during 2009, pension funds in the OECD recovered around USD 1.5 trillion of the USD 3.5 trillion in market value that they had lost in 2008 (from USD 18.7 trillion in December 2007 to USD 15.3 trillion in December 2008).

Pension funds efficiency, as measured by the total operating costs in relation to assets managed, ranges from 0.1% to 1.2% (Figure 3).

In general, countries with defined-contribution systems and those with large numbers of small funds appear to have higher operating costs than countries that only have a few funds offering defined-benefit, hybrid, or collective defined-contribution pension arrangements. This is in contrast to the general trend of transition from defined benefit to defined contribution plans (Turner and Hugues, 2008).



1. Data refers to 2008.

2. Data does not include investment management costs.

3. Data does not include self-managed superannuation funds.

Source: OECD Global Pension Statistics.

Figure 3. Pension funds' operating expenses as a share of total investments in selected OECD countries, 2009 (%)

1.1 Private pension funds in Portugal

In Portugal, a voluntary occupational private pension system has been in operation since 1985, with a specific fiscal status which, in certain sectors such as banking, serves as an alternative to the defined benefit plans provided by the public sector. Personal retirement saving plans (PRSP) were launched in 1989.

The importance of the private pension sector has been growing in recent years, as pension reforms have reduced public pension entitlements and facilitated a complementary system (Garcia, 2004, 2006). In addition to occupational pension plans, this sector includes voluntary personal pension plans, both of which constitute the second and third pillars of the retirement system (Ostaszewski, 2012b).

Decree-Law Nr. 12/06 currently regulates their activity, following the 2003/41/CE Directive. The

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main purpose of these provisions is to achieve the consolidation of the funds' role as the privileged vehicle for private, complementary financing of the costs of covering the social risks associated with retirement.

Indeed, as far as complementary plans are concerned, this system can be considered to be a veritable put-option, in favour of employees, as explained by Merton et al. (1987).

A distinction must be made between those pension funds managed by dedicated pension fund management companies and those under the management of life insurance companies. In 2010, there were 25 pension funds management institutions and 237 pension funds with 19,725 million euro of assets under their management[11].

The majority of pension funds, about 80 per cent of them, are managed by pension fund managers representing 98 per cent of the value under management, enhancing the role of pension funds management companies. In 2009, the private pension funds industry represented 13.40% of GDP of Portugal, amounting to 21,917 million euros. Closed pension funds are prominent among the various types of pension funds, representing more than 80 per cent of the amount under management. A closed fund is generally one in which there is only one member/sponsor. Should there be more than one member, this is subject to the condition that a connection of a corporate, associative, professional or social nature exists among the members, and that the consent of all of the existing members must be given before new members can be included. Closed funds, as well as open funds, are occupational. In an open fund there is no requirement for any connection whatsoever among the different parties constituting the fund and adhesion to the latter depends solely on acceptance being granted by the fund's managing institution[12]. PRSP type is for personal funds.

With regard to employment sectors, the banking and telecoms group pension schemes together account for the largest segment of the occupation pension fund market in Portugal.

The majority of pension plans are of the defined benefit type. In defined contribution plans, contributions are customarily calculated as a pre-determined fraction of salary, although this fraction does not necessarily remain constant throughout the employee's working life. Many defined benefit plan formulae take into account the Social Security benefits to which employees are entitled. In such cases, the plans are said to be integrated and the value of the complementary pension will depend on the final value of the State pension. Contributions to these plans are generally based on a targeted benefit and can be shared between the employer and the employee.

As far as participation in their financing is concerned, the pension plan can further be classified as contributive or non-contributive. In the case of the former, the employee finances the plan together with the employer, which leads to the existence of vested rights; in the latter case, the employer has sole responsibility for the financing, and such rights usually cease to exist in the event of an employee's early departure.

On the other hand, there is a decreasing trend of the defined benefit plans type of pension, and an increasing trend of the defined contribution plans type, probably as a result of accounting rules and regulatory changes (Yermo, 2007).

2.1 The composition of the portfolio and profitability

Investments portfolio composition registers a declining trend of the public debt component. By 2009, private pension funds invested 21.30% in government bonds. On the other hand, the proportion accounted for by equities and trust units rose substantially, representing 37.50% in 2009.

With regard to profitability, only aggregate information is available (Table 2).

[11] Since 2010 the government of Portugal transferred some funds of the telecom and banking sectors to the social security system. The money was used to reduce the fiscal deficit and help meet Maastricht targets.

[12] Open funds can be constituted on the initiative of any institution authorized to manage pension funds. The global net value of the fund is divided into whole or partial participation units, which can be represented by certificates.

*

Table 2. Nominal returns on pension funds in Portugal, 2000-2009, %

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Averag 200 200
Total	3.1	-2.2	-3.4	8.2	7.2	9.1	8.8	6.3	-13.9	9.7	3.2
Closed pension funds	3.3	-2.2	-3.5	8.3	7.3	9.2	9.0	6.5	-14.2	9.8	3.3
Open pension funds	0.7	-1.0	-1.1	6.0	4.8	6.0	5.3	3.1	-9.5	7.8	2.2

Source: Relatório do Sector Segurador and Fundos de Pensões, 2003 to 2006, ISP (according to ISP, management costs are negligent)

The average rate of return for all types of pension funds decreased over the period 2000-2002. A positive trend is noticeable since 2003. However, the 2008 crisis had a very negative impact on profitability. In that year, pension funds registered the lowest rates of return in all the period, for all types of pension funds.

This means that risks associated with pension funds should be taken into account especially that of market risk (Garcia, 2004; Bovenberg, 2007; Franzen, 2010).

4. Results comparisons

Comparing the investment performance results of State capitalisation by the analysis of public pension reserve funds, as opposed to those of private pension funds, enables one to conclude that the former clearly perform better in a bear market (Figure 4).

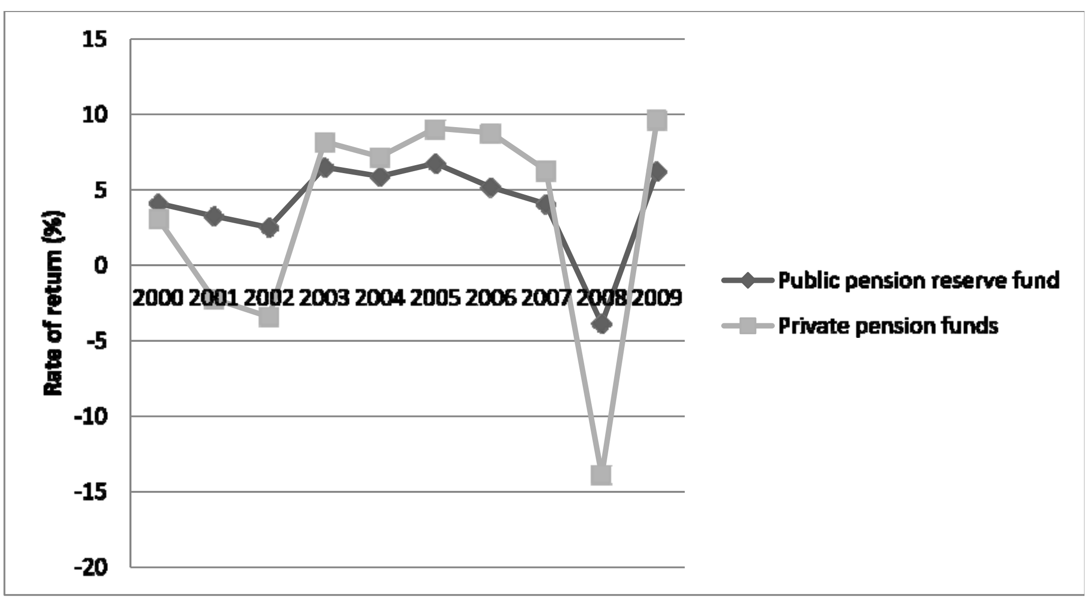

Figure 4. Pension funds' nominal net investment return in private and public pension funds in Portugal, 2000-2009 (%)

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In addition, the average rate of return over this ten years period is higher in the case of public pension reserve funds being 4.07% versus the average of 3.29% in the case of private pension funds.

Portfolio composition, as well as the performance of different types of assets might explain this conclusion. The weight of bonds is much bigger in the State portfolio, always being more than 70%, due to limitations by law, as opposed to the weight registered in private pension funds' portfolios, which is less than 50% since 1999.

Investment performance assessment in comparative terms should be considered by policy makers when the importance of complementary private retirement savings is increased. In fact, the 2008 crisis has highlighted the vulnerability of funded pension schemes to financial crises and economic downturns (Orenstein, 2013). Furthermore, it has emphasized the need to review the regulatory framework and scheme design to improve the safety of private pensions. Indeed, in the European Union, two instruments are already in place: the Directive on the protection of employees in the event of insolvency of their employer, and the Directive on the activities and supervision of Institutions for Occupational Retirement Provision. The pension market integration in the EU has been passing through several phases (Hennessy, 2011).

5. Conclusion

The aim of this work has been to analyse public pension reserve funds and private pension fund markets in Portugal. The focus of the analysis was on asset management results comparison and on the policy implications of the results.

The basic pay-as-you-go government-oriented pension is complemented by a privately-funded pension which, when integrated with the Social Security scheme, constitutes a true financial option sold by the employer to the employee. For the employee, the most important factor is the guarantee of a secure income on retirement, regardless of the pension's source. Therefore, an optimum portfolio of pension benefits is created, with the State component being the risk-free asset and a private component comprising the volatile asset, both occupational and personal.

The introduction, in 1989, of partial public capitalisation, together with the establishment of a public pension reserve fund return, highlights the need for comparison with existing private capitalisation. The assessment of public, versus private, pension fund management, reinforces the idea that public management is not necessary bad and that private management is not necessarily good.

Furthermore, investment performance analysis of pension funds in Portugal, either occupational or personal, justifies a detailed analysis of the problem of individuals' capacity to protect themselves adequately in the absence of proper financial education and consumer regulation (Casey, 2004; Garcia, 2006; Waine, 2009). Frequently, the global movement of Social Security reforms has an implicit assumption about behavior, namely that the individual citizen to whom the responsibility of choice has been handed to, is a well-informed economic agent, who acts rationally to maximize their self-interest (Ring, 2010). However, in the real world, peoples' decisions are subject to several restrictions such as bounded rationality, bounded self-control, bounded self-interest or bounded selfishness (Burtless, 2004). In fact, individuals often base their retirement and saving choices on herd behavior, faulty logic, or defective information, showing astonishing ignorance of the most basic processes that determine future retirement incomes (Webb, 2009; Munnell et al. 2011; Casey and Dostal, 2013). Social Security reforms might have created unintended consequences in the case of the risk posed by a retirement crisis (Lalani, 2012; Borowski, 2013).

The recognition of these constraints is very important for the design, management and regulation of retirement systems. Retirement plan sponsors and policymakers are (and should be) becoming more aware of these issues, and are taking actions to promote consumer education and regulation (European Commission, 2012).

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What if Output Persistence is Disregarded by an Opportunistic Incumbent?

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Abstract – **This note presents the consequences of output persistence being disregarded by an electorally motivated incumbent. In this case, incumbent's policies are suboptimal not only socially but also from the electoral point of view.**

Keywords - *Electoral cycles, Imperfect modes, Output persistence.*

1. Introduction

The consequences arising from the fact that real variables, such as unemployment or output, exhibit a degree of persistence over time have been analysed since some time ago (see, e.g., Jonsson, 1997; Lockwood, 1997; Svensson, 1997; Caleiro, 2012). A particularly interesting consequence of output persistence is that it may turn upside down the political business cycle, which, in its typical form, is associated with depressions at the beginning of the mandate followed by pre-election inflationary expansions (Gärtner, 1996; Gärtner, 1997; Caleiro, 2009). Somehow related to this result is the fact that, when the rationality of the electorate is bounded, an error on the classification, by the electorate, of the incumbent's behavior, may exist, when the level of output displays persistence (Caleiro, 2013).

A recent observation of reality seems to confirm that the typical pattern of the electoral cycle seems to be so deep-rooted that an electorally motivated government, whose rationality is also bounded, considers that it must implement a (more than socially desirable) contractionary policy at the beginning of the mandate, so that, at the end of the mandate, it has (better) conditions to implement expansionary policies. A behavior of that type by the incumbent also seems to reveal that it may also act under the veil of ignorance (of the persistence in output). In other words, when determining the economic policy the incumbent may use a stylized model, this model being imperfect due to the ignorance of output persistence (Chow, 1977). In this case, incumbent's policies are suboptimal not only socially but also from the electoral point of view.

The rest of the paper is structured as follows. Section 2 offers the correct model, i.e. the one ruling the true functioning of the economy, which is based upon an aggregate supply curve embodying output persistence, as well as the imperfect model, i.e. the one considered by the incumbent, which disregards output persistence. Section 3 concludes.

2. The Models

Recently some authors have assumed an extended version of the standard aggregate supply curve $y_t = \bar{y} + \beta\left(\pi_t - \pi_t^e\right)$, where y_t denotes the level of output, that deviates from the natural level, $\bar{y}$, whenever the inflation rate, π_t, deviates from its expected level π_t^e, by considering

$$y_t = (1-\eta)\bar{y} + \eta y_{t-1} + \delta\left(\pi_t - \pi_t^e\right), \qquad (1)$$

where η measures the degree of output persistence. See Gärtner (1999) for an output persistence case and/or Jonsson (1997) for an unemployment persistence case.

When normalizing the natural level of output such that $\bar{y} = 0$ the aggregate supply curve reduces to:

$$y_t = \phi y_{t-1} + \alpha\left(\pi_t - \pi_t^e\right), \qquad (2)$$

where, following the hypothesis of adaptive expectations,

$$\pi_t^e = \gamma\pi_{t-1} + (1-\gamma)\pi_{t-1}^e, \qquad (3)$$

where $0 \le \phi \le 1$ and $0 \le \gamma \le 1$.

Model (2) is thus the correct representation of the functioning of the economy. When disregarding the existence of persistence in output, an imperfect model is to be considered, i.e.

$$y_t = \alpha\left(\pi_t - \pi_t^e\right). \qquad (4)$$

In what concerns the incumbent's objective function, we make the standard assumption that the incumbent faces a mandate divided into two periods, t = 1,2, such that society's welfare during the mandate, i.e. the benevolent government's objective function is given by:

$$W = W_1 + \rho W_2, \qquad (5)$$

where ρ is the social rate of discount, whereas opportunistic government's objective function is :

$$V = \mu V_1 + V_2, \qquad (6)$$

where μ is the degree of memory of the electorate. In (5) and (6) we also consider that

$$W_t = V_t = -\tfrac{1}{2}\pi_t^2 + \beta y_t. \qquad (7)$$

Considering first the case of a benevolent incumbent, the correct policy and outcomes will be, respectively, the values of inflation and output which result from the maximisation of (5) subject to (2) and (3). This immediately leads to the optimal policies:[1]

$$\pi_1^B = \alpha\beta\left(1 - \rho\left(\gamma - \phi\right)\right), \qquad (8)$$

$$\pi_2^B = \alpha\beta, \qquad (9)$$

i.e.

$$\pi_2^B - \pi_1^B = \alpha\beta\rho\left(\gamma - \phi\right). \qquad (10)$$

In the steady state cycle, i.e. when $\pi_2^e = \pi_0^e$ and $y_2 = y_0$, output levels will be given:

$$y_1^B = \frac{\alpha}{(1+\phi)(2-\gamma)}\left(\pi_1 - \pi_2\right), \qquad (11)$$

$$y_2^B = \frac{\alpha}{(1+\phi)(2-\gamma)}\left(\pi_2 - \pi_1\right), \qquad (12)$$

i.e.

$$y_1^B = \alpha^2\beta\rho\,\frac{\phi - \gamma}{(1+\phi)(2-\gamma)}, \qquad (13)$$

$$y_2^B = \alpha^2\beta\rho\,\frac{\gamma - \phi}{(1+\phi)(2-\gamma)}. \qquad (14)$$

Plainly, in the case of output persistence being disregarded, inflation rates will be

$$\pi_1^B = \alpha\beta\left(1 - \rho\gamma\right), \qquad (15)$$

$$\pi_2^B = \alpha\beta, \qquad (16)$$

i.e.

$$\pi_2^B - \pi_1^B = \alpha\beta\rho\gamma. \qquad (17)$$

Given that the economy functions in accordance to the correct model (2), the imperfect policies (15) and (16) give rise to output levels being:

$$y_1^B = -\frac{\alpha^2\beta\rho\gamma}{(1+\phi)(2-\gamma)}, \qquad (18)$$

$$y_2^B = \frac{\alpha^2\beta\rho\gamma}{(1+\phi)(2-\gamma)}. \qquad (19)$$

Finally, it matters to present the differences between the use of the correct (*c*) and the imperfect (*i*) model by the benevolent incumbent. In terms of the inflation rates,

$$\pi_1^i - \pi_1^c = -\alpha\beta\rho\phi < 0, \qquad (20)$$

$$\pi_2^i - \pi_2^c = 0, \qquad (21)$$

whereas, in terms of output levels,

$$y_1^i - y_1^c = -\beta\rho\phi\alpha^2 < 0, \qquad (22)$$

$$y_2^i - y_2^c = -\beta\rho\phi\alpha^2\left(\phi - \gamma\right), \qquad (23)$$

which, in the stationary cycle situation, are given by

$$y_1^i - y_1^c = -\frac{\alpha^2\beta\rho\gamma}{(1+\phi)(2-\gamma)} < 0, \qquad (24)$$

$$y_2^i - y_2^c = \frac{\alpha^2\beta\rho\gamma}{(1+\phi)(2-\gamma)} > 0. \qquad (25)$$

Considering now the case of an opportunistic incumbent, the correct policy and outcomes will be, respectively, the values of inflation and output which result from the maximisation of (6) subject to (2) and (3). The optimal policies are:

$$\pi_1^O = \alpha\beta\left(1 - \frac{\gamma - \phi}{\mu}\right), \qquad (26)$$

$$\pi_2^O = \alpha\beta, \qquad (27)$$

i.e.

[1] From this point onwards, the superscripts *B* and *O* identify an element as, respectively, concerning the benevolent and the opportunistic incumbent.

$$\pi_2^O - \pi_1^O = \frac{\alpha\beta(\gamma-\phi)}{\mu}. \tag{28}$$

In the case of output persistence being disregarded by the opportunistic incumbent, inflation rates will be

$$\pi_1^O = \alpha\beta\left(1-\frac{\gamma}{\mu}\right), \tag{29}$$

$$\pi_2^O = \alpha\beta, \tag{30}$$

i.e.

$$\pi_2^O - \pi_1^O = \frac{\alpha\beta\gamma}{\mu}. \tag{31}$$

The differences between the use of the correct (c) and the imperfect (i) model by the benevolent incumbent are as follows. In terms of the inflation rates,

$$\pi_1^i - \pi_1^c = -\frac{\alpha\beta\phi}{\mu} < 0, \tag{32}$$

$$\pi_2^i - \pi_2^c = 0, \tag{33}$$

whereas, in terms of output levels,

$$y_1^i - y_1^c = -\frac{\beta\phi\alpha^2}{\mu} < 0, \tag{34}$$

$$y_2^i - y_2^c = -\frac{\beta\phi\alpha^2(\phi-\gamma)}{\mu}, \tag{35}$$

which, in the stationary cycle situation, are given by

$$y_1^i - y_1^c = -\frac{\alpha^2\beta\gamma}{(1+\phi)(2-\gamma)\mu} < 0, \tag{36}$$

$$y_2^i - y_2^c = \frac{\alpha^2\beta\gamma}{(1+\phi)(2-\gamma)\mu} > 0. \tag{37}$$

3. Concluding Remarks

This note presents the consequences of output persistence being disregarded by the incumbent, being of special importance the case where the incumbent is electorally motivated. In this case, the typical pattern of the political business cycle may, indeed, lead the incumbent to consider that, in all circumstances, should implement contractionary policies at the beginning of the mandate, followed by expansionary policies at the end of the mandate. This behaviour implies that the incumbent may be disregarding output persistence, i.e. the consideration of an imperfect model. If this is the case, incumbent's policies are suboptimal not only socially but also from the electoral point of view.

In particular, when output persistence is disregarded, a sub-utilisation of inflation rates is to be observed at the beginning of the paper, which, in the steady state cycle, leads to an over-depression of output, followed by an over-expansion of output at the end of the mandate. Figure 1 shows the evolution of short term political business cycles in output to the steady state cycle when the correct – i.e. taking into account output persistence – and the imperfect – i.e. when output persistence is disregarded – as models are considered .

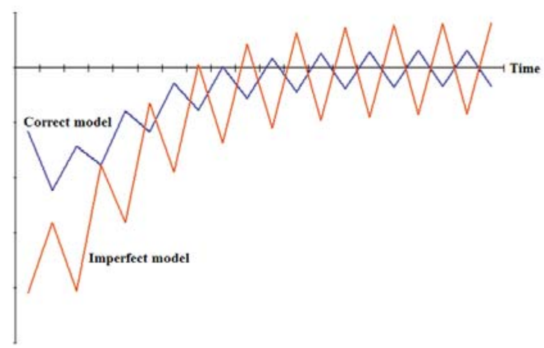

Figure 1 – The evolution of political business cycles

As a direction for future improvements we would like to proceed with an empirical test of the results, for instance following the approach in Caleiro (2012).

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Commons Management: A Reflection over the Current Crisis

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Abstract **- Capitalism prevails as economic system. But often inside the system - or even emerging and going out – there are many emerging crises and there is much discussion around the system itself. Nowadays, new processes are coming to force a new vision to the economic practices. The present study presents a new vision for business and new promising ways of commitment to alternative structures but sometimes being essentially a complementary organization of society to the current standard.**

Keywords **–** *Commons Management, Collaborative Commons, Cooperation, Capitalism.*

1. Introduction

Nowadays capitalism beliefs are under discussion, being capitalism principles a target for much criticism. The recent crisis has brought many arguments favouring a new debate. The recent crisis brought many troubles that successively create new waves of economic problems. Many say that the system is not perfect but, at the same time, that there has been no alternative systems and, therefore, it is the only viable in the context of modern economies.

Anyway, new effective possibilities have been appearing, giving new support to new economic practices. As a reflex, new theoretical sights are emerging.

As defended in several papers, cooperation and coordinated activities may often promote wealth (see Filipe 2011; Filipe *et al* 2012; Filipe *et al* 2013a). Also corporate social responsibility may bring room for a new exercise on human practices in businesses and society. It is recognized that companies use a corporate social responsibility policy for satisfying multiple self purposes including the companies' aims of survival in the long term and company's image. Anyway, corporate social responsibility can be seen as the basis of a new philosophy and allows new behaviours in seeking a kind of participatory and supportive society (Filipe *et al* 2013b).

Some views on the way business is made nowadays allow also a new perspective of what can be emerging as a new supportive businesses practice.

As so, some new perspectives of analysis grant new emphasis to the changes needed in nowadays society, preparing a new philosophy in the way of living and a new order in the society's organization. Many claims have been made by civil society in terms of economic and social policies and for the political class itself in many countries. There have been also many complaints about malpractices in large companies or related to the relationships that exist between businessmen and politicians. These placements of society vis-à-vis the current *status quo* show the great need for change that seems to be working in varied forms of a paradigm shift.

Considering the spontaneous economic movements inside the system, the example of Rifkin's (2014) "The Zero Marginal Cost Society" shows how internet may change profoundly the run of capitalism. In "The Zero Marginal Cost Society", Rifkin (2014) describes how the "emerging 'internet of things' is speeding people to an era of nearly free goods and services, precipitating the meteoric rise of a global Collaborative Commons and the eclipse of capitalism".

Considering several new theoretical formulations and the outlook in new contexts, it is possible to anticipate new considerations to encompass a new perspective of approach, on the basis of a new reality. The development of science, technology, social conscience and new economic practices allow a theoretical reformulation of society and the economy. Branches of Economic Science have provided new analysis grids such as Neuroeconomics, Chaos theory, the Commons and Anti-commons frameworks, Game theory or applied nanotechnology to be used in companies for example, bringing new advances and enabling a more integrated analysis of economic and social reality.

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In the field of property rights, the discussion is old but a new perspective brings a new open door for the debate. In the last decades the discussion has been enlarged to consider new frameworks; and new perspectives are being proposed for providing a new rule for markets analysis.

As studied for commons and also for anti-commons, inefficiencies and externalities may result from free access to open resources and from too many fragmented property rights, respectively. Although there is a set of considerations needed for a correct definition of the property rights, finding correct solutions for over passing the inadequacy and bringing new contexts allows that a new society organization may be developed.

A new type of organization to society is possible, including a new democratic process of definition of production rules, involving for example the production on a communities organization basis or the "global village" based demanding by creating a spontaneous demand support for production. However, in a large extensive sense, the reorganization of the society's structures in all strands is quite difficult to get. There are many interests involved and so a system reform is quite difficult or even impossible in a large scale.

The changes and any shake-up in the society may be seen by parts and resulting from inside, from the system itself autonomously and spontaneously. The proposed system by Rifkin (2014) is itself an example of that, or even the comeback in several parts of the world to the tradition and revivalism.

2. A new Production Mode Stream

Considering the usual strand of vision for production in the last centuries it seems difficult to get significant changes involving the basis of the capitalism system. Anyway, several experiences have resulted as alternatives, usually in a short scale basis. However, the system seems to fail and many are defending the need of its reformulation. Besides, some practices are working in a larger scale. Cooperation and coordination seem to get successively more importance in the management and influence of the production system.

For instance, let's see the example of 'commons-based peer production' (see for example Benkler 2002, 2006 or Rifkin 2014). Benkler's research focuses on commons-based approaches for managing resources in networked environments. He invented the term 'commons-based peer production' (Benkler, 2002) to describe collaborative efforts based on sharing information, such as free and open source software and Wikipedia[1]. He uses the examples of Wikipedia, Slashdot, the Open Directory Project, and Google to reveal fundamental characteristics of commons-based peer production, distinguishing it from the property - and contract - based modes of firms and markets. He also uses the term 'networked information economy' to describe a "system of production, distribution, and consumption of information goods characterized by decentralized individual action carried out through widely distributed, nonmarket means that do not depend on market strategies" (Benker, 2006).

Commons-based peer production represents a new model of socio-economic production in which the creative energy of a large number of people is coordinated (usually with the aid of the Internet) into large, meaningful projects mostly without traditional hierarchical organization. These projects are often, but not always, conceived without financial compensation for contributors.

Benkler (2006) examines the ways in which information technology permits extensive forms of collaboration that have potentially transformative consequences for economy and society. Benkler contrasts commons-based peer production (based on sharing resources among widely distributed individuals who cooperate with each other) with firm production (in which tasks are delegated, based on a central decision-making process) and market-based production (in which tagging different prices to different tasks serves as an incentive to anyone interested in performing a task). Also refers peer production as being a subset of commons-based production practices. It refers to a production process that depends on individual action that is self-selected and decentralized. YouTube and Facebook, for example, are based on peer production.

Tapscott and Williams (2006)[2] suggest an incentive mechanism behind common-based peer production. "People participate in peer production

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[1] The paper's title "Coase's Penguin, or Linux and the Nature of the Firm" refers to Ronald Coase, who originated the transaction costs theory of the firm that provides the methodological template for the positive analysis of peer production offered in the paper, and "Penguin" to the Linux mascot.

[2] According to the authors, Wikinomics is based on four ideas: Openness, Peering, Sharing, and Acting Globally.
Wiki is a web application which allows people to add, modify, or delete content in collaboration with others.

communities for a wide range of intrinsic and self-interested reasons... basically, people who participate in peer production communities love it. They feel passionate about their particular area of expertise and revel in creating something new or better".

Following this idea, Rifkin (2014) argues that the capitalist era is passing - not quickly, but inevitably. The rising 'internet of things' is giving rise to a new economic system - the Collaborative Commons - that will transform people's way of life. Rifkin exposes a paradox at the core of capitalism that has impelled it to a very high stage but is now passing away - the inherent entrepreneurial dynamism of competitive markets that drives productivity up and marginal costs down, enabling businesses to reduce the price of their goods and services in order to win over consumers and market share.

The central point defended by Rifkin (2014) is that if the marginal cost of producing each additional item falls close to zero, then everything gets a tendency to become almost free. In the pursuit of profit, businesses will have irrevocably undermined their own margins: capitalism will have destroyed itself. Rising in its place, Rifkin argues that there will be a civilisation based on a new and more fulfilling communitarianism, free of the hang-ups that have characterised the materialistic individualism of the late capitalist age.

Rifkin (2014) defends that the Collaborative Commons is the first new economic paradigm to take root since the advent of capitalism - and its antagonist socialism. The Collaborative Commons is already transforming the way people's organize their economic life, with profound implications for the future of the capitalist market.

The trigger for this great economic transformation is known as Zero Marginal Cost[3]. Ironically, Rifkin says that while economists have always welcomed a reduction in marginal cost, they never anticipated the possibility of a technological revolution that might bring marginal costs to near zero, making goods and services priceless, nearly free, and abundant, and no longer subject to market forces. He stands that a formidable new technology infrastructure - the Internet of things (IoT) is emerging with the potential of pushing large segments of economic life to near zero marginal cost in the years ahead. Rifkin describes how the Communication Internet is converging with a nascent Energy Internet and Logistics Internet to create a new technology platform that connects everything and everyone. Billions of sensors are being attached to natural resources, production lines, the electricity grid, logistics networks, recycling flows, and implanted in homes, offices, stores, vehicles, and even human beings, feeding Big Data into an IoT global neural network.

Rifkin (2004) enrols the evidences of collaborative commons benefits. Prosumers[4] can connect to the network and use Big Data, analytics, and algorithms to accelerate efficiency, dramatically increase productivity, and reduce the marginal cost of producing and sharing a wide range of products and services to near zero, just like they now do with information goods. They can now produce and share their own music via file sharing services, their own videos on YouTube, their own knowledge on Wikipedia, their own news on social media, and even their own free e-books on the Internet. The plummeting of marginal costs is spawning a hybrid economy - part capitalist market and part Collaborative Commons - with far reaching implications for society. Hundreds of millions of people are already transferring parts of their economic lives to the global Collaborative Commons. Prosumers are plugging into the fledgling IoT and making and sharing their own information, entertainment, green energy, and 3D-printed products at near zero marginal cost. They are also sharing cars, homes, clothes and other items via social media sites, rentals, redistribution clubs, and cooperatives at low or near zero marginal cost. Students are enrolling in free massive open online courses (MOOCs) that operate at near zero marginal cost. Social entrepreneurs are even bypassing the banking establishment and using crowd funding to finance start up businesses as well as creating alternative currencies in the fledgling sharing economy. In this new world, social capital is as important as financial capital, access trumps ownership, sustainability supersedes consumerism, cooperation ousts competition, and "exchange value" in the capitalist marketplace is increasingly replaced by "sharable value" on the Collaborative Commons.

[3] Marginal cost is the cost of producing an additional unit of a good or service after fixed costs have been absorbed. Businesses have always sought new technologies that could increase productivity and reduce the marginal cost of producing and distributing goods and services, in order to lower their prices, win over consumers and market share, and return profits to their investors.

[4] Proactive consumers.

Rifkin concludes that capitalism will remain, in an increasingly streamlined role, primarily as an aggregator of network services and solutions, allowing it to flourish as a powerful niche player in the coming era. Rifkin says that people are now entering a world beyond markets where are learning how to live together in an increasingly interdependent global Collaborative Commons.

3. New Ways, New Problems

The new world viewed by Rifkin (2014) brings the new spontaneous organization of societies in a very cooperative virtual world. This vision shows the perspective of mass production with zero marginal costs, in the future. For example, Rifkin anticipates that by 2030, there will be more than 100 trillion sensors connecting the human and natural environment in a global distributed intelligent network. Besides, he refers, the bulk of the energy we use to heat our homes and run our appliances, power our businesses, drive our vehicles, and operate every party of the global economy will be generated at near zero marginal cost and be nearly free in the coming decades. That is already the case for several million early adopters who have already transformed their homes and businesses into micro-power plants to harvest renewable energy on-site.

This shows in fact a tremendous improving in productivity and well-fare enhancement. However, nowadays countries are facing a problem of unemployment and a set of strong unbalances. So that, the new economic performances will depend on integrating new innovations, including organizational and logistic, with the societies trends on the systems' balances.

It is impossible to dissociate the new role of technology with the level of employment and with the level of population structure as well as the way factories perform standing on new processes technology intensives. The new arrangements for society´s development need to integrate constantly the different stages of technology improvements, the collaborative commons and the societies structures.

4. A New Scenario

As stated in Filipe (2011), many countries are facing strong financial and debt problems as much as high unemployment rates, long term low economic growth rates and low inflation rates. The crises scenario is conducting to significant economic, social and political problems.

There are severe difficulties generated by the measures that governments are implementing currently, particularly in some European Countries. Many regions and many families as much as many companies in many countries in Europe are dealing with severe economic and social problems.

A new model for these societies may be discussed, considering that:

- Many projects of social responsibility are being developed, involving communities in order to create value, to organize structures from which families may live from.
- People is reducing costs, by sharing resources.
- Communities projects are developed to enhance new value, with shared resources.
- Internet is allowing to get products with lower price.
- Internet is allowing to share resources and create products, with zero marginal costs.
- Internet allows to improve knowledge without significant costs.

Anyway, several perils are close and they have to be considered:

- There are many macroeconomic unbalances.
- Growth is based on monetary Add Value.
- Companies profits are the support of new investments and employment.
- The world population keeps growing and unemployment is growing as well.
- The International worldwide environment is exasperated: economically, politically and socially.

The supportive arguments of a new era for humanity show the enormous potentialities of human accomplishments. However, they are also the fundamentals for the need of a reorganization in countries structures, societies organization, for a new vision of economics regimes' orientation and an economics' system redefinition. The adjustments have to be made gradually and supported with production adjustments and supporting government's directives.

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Identifying Small Market Segments with Mixture Regression Models

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Abstract **- The purpose of this work is to determine how well criteria designed to help the selection of the adequate number of market segments perform in recovering small niche market segments, in mixture regressions of normal data. As in real world data the true number of market segments is unknown, the results of this study are based on experimental data. The simulation experiment compares 27 segment retention criteria, comprising 14 information criteria and 13 classification-based criteria. The results reveal that AIC3, AIC4, HQ, BIC, CAIC, ICLBIC and ICOMPLBIC are the best criteria in recovering small niche segments and encourage its use.**

Keywords - *Market segmentation, niche markets, mixture regression models, experimental design.*

1. Introduction

Mixture regression models have recently received increasing attention from both academics and practitioners as a statistical model-based approach to deal with consumer heterogeneity and thus to identify effective market segments. In fact, several studies have set out to assess the relative performance of different segmentation methods for segmenting the market (Vriens et al. 1996, Magidson and Vermunt 2002, Andrews et al. 2010, Kim and Lee 2011) and concluded that mixture regression modelling outperformed other approaches in terms of marketing strategy potential. Mixture regression models "are the newest of the segmentation methods" (Kim and Lee, 2011: 157) and claimed to be the "most powerful algorithm for market segmentation" (Wedel and Kamakura 2000: 26). According to Andrews et al. (2010: 1) this approach is clearly preferred "if it is important to understand the true segmentation structure in a market as well as the nature of the regression relationships within segments".

However, in spite of the popularity of mixture regression models for normal data in market segmentation problems, the decision of how many market segments to keep for managerial decisions is, according to many authors (DeSarbo et al. 1997, Wedel and DeSarbo 1995, Wedel and Kamakura 2000, Hawkins et al. 2001, Andrews and Currim 2003a,b, Sarstedt 2008), an open issue without a satisfactory statistical solution. To assess the true number of market segments is essential because many marketing decisions -segmentation, targeting, positioning, marketing mix – depend on the correct specification of the models used as input to these decisions (Sarstedt 2008). A misspecification of the model resulting in under or over specification might lead to erroneous estimations of the response by consumers to marketing efforts.

In order to reduce some of the subjectivity in this task, managers often rely on heuristics as information and classification-based criteria to guide them on the selection of the model to pick (Dillon and Mukherjee, 2005). Therefore, it is important to understand how the segment retention criteria behave. Besides, since the true number of market segments in real world data is unknown, the evaluation of the effectiveness of segment criteria is usually accomplished through an experimental design. It is generally clear from previous simulation studies focusing on the segment retention problem in mixture regression models that the type of distribution being mixed, the model specification and the characteristics of the market affect the accuracy of commonly used segment retention criteria and that additional research should continue to search for

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better criteria for market segmentation under specific data characteristics.

Consequently, the aim of this work is to determine how well criteria designed to help the selection of the adequate number of market segments perform in mixture regression models of normal data, addressing a special market condition not considered in previous studies, that is considering into the same simulated sample small niche segments with different degrees of separation and different sizes. As a large number of criteria were not considered before, we aim at comparing the performance of 27 criteria.

We aim at providing guidelines to marketing practitioners to improve the use of the model fit indices to identify small market segments (Goller et al 2002).

The plan of this work is as follows: we start reviewing the mixture regression model for normal data, followed by a brief description of the criteria that we aim to compare and a summary of the results obtained in previous studies on this matter. Next, we describe the experimental design used to generate the simulated data. After that, we provide a discussion of the findings of the study and finish with a conclusion.

2. Background

2.1. Multivariate Normal Mixture Regression

Mixture regression models are predictive approaches for segmentation analysis (Wedel and Kamakura 2000). Indeed, the rationale of this statistical approach is to identify segments that are homogeneous in terms of response coefficients (Magidson and Vermunt 2002), thus providing a direct linkage between actual behaviour (i.e., the dependent variable) in the marketplace and managerially actionable variables of the marketing mix or consumer characteristics (i.e., the predictors). As the number and structure of market segments are determined by the researcher on the basis of the results of the data analysis, mixture regression models are also post hoc approaches (Wedel and Kamakura 2010). Thus, to help the analysis of the available approaches to select the number of market segments, a brief description of the notation of the well-known classical mixture regression model (Wedel and DeSarbo, 1995) is previously presented. Let:

$s = 1,\ldots,S$ indicate derived segments;
$n = 1,\ldots,N$ indicate consumers;
$r = 1,\ldots,R$ indicate repeated observations from consumer n;
$j = 1,\ldots,J$ indicate explanatory variables;
β_{js} = be the value of j - *th* regression coefficient for the s - *th* cluster;
$\boldsymbol{\beta}_s = (\beta_{js})$;
$\boldsymbol{\Sigma}_s$ = be the covariance matrix for segment s;
y_{nr} = be the value of the dependent variable for repeated measure r on consumer n;
$\mathbf{y}_n = (y_{nr})$;
x_{njr} = be the value of the j - *th* independent variable for repeated measure r on consumer n;
$\mathbf{x}_n = ((x_{njr}))$.

Assume that the metric dependent vector $\mathbf{y}_n = (y_{nr})$ is distributed as a finite mixture of S conditional multivariate normal densities (1):

$$\mathbf{y}_n \sim \sum_{s=1}^{S} \lambda_s f_s\left(\mathbf{y}_n \middle| \mathbf{x}_n, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right) \tag{1}$$

where f_s is defined by the expression:

$$f_s\left(\mathbf{y}_n \middle| \mathbf{x}_n, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right) = (2\pi)^{-R/2} \left|\Sigma_s\right|^{-1/2} \exp\left[-1/2\left(\mathbf{y}_n - \mathbf{x}_n\boldsymbol{\beta}_s^{'}\right)\Sigma_s^{-1}\left(\mathbf{y}_n - \mathbf{x}_n\boldsymbol{\beta}_s^{'}\right)'\right] \tag{2}$$

and λ_s , $s = 1,\ldots,S$ are independent mixing proportions satisfying the following restrictions:

$$0 \le \lambda_s \le 1 \tag{3}$$

$$\sum_{s=1}^{S} \lambda_s = 1 \,. \tag{4}$$

Given a sample of N independent consumers, one can thus derive the likelihood (5) and the log-likelihood (6) expressions:

$$L = \prod_{n=1}^{N} \left[\sum_{s=1}^{S} \lambda_s f_s\left(\mathbf{y}_n \middle| \mathbf{x}_n, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right) \right] \tag{5}$$

$$\ln L = \sum_{n=1}^{N} \ln \sum_{s=1}^{S} \lambda_s f_s\left(\mathbf{y}_n \middle| \mathbf{x}_n, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right) \tag{6}$$

The implementation of the maximum likelihood procedure is done by using an Expectation-Maximization – EM type framework (Dempster *et al.* 1977). In order to derive the EM algorithm it is necessary to introduce non-observed data via the indicator function: $z_{ns} = 1$, if n comes from latent class s and $z_{ns} = 0$, otherwise; it is assumed that z_{ns} are i.i.d multinomial. So, the joint likelihood of the "complete data" $\mathbf{y}_n = (y_{nr})$ and $\mathbf{z}_n = (z_{ns})$ for all consumers is:

$$\ln L_c = \sum_{n=1}^{N}\sum_{s=1}^{S} z_{ns} \ln\left[f_s\left(\mathbf{y}_n \middle| \mathbf{x}_n, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right)\right] + \sum_{n=1}^{N}\sum_{s=1}^{S} z_{ns} \ln \lambda_s \tag{7}$$

Once estimates of $\boldsymbol{\lambda}$, $\boldsymbol{\Sigma}$ and $\boldsymbol{\beta}$ are obtained for any M-step procedure, one can assign each consumer n to each market segment S via estimated posterior probability (applying Bayes' rule), providing a fuzzy clustering (E-step):

$$p_{ns} = \frac{\lambda_s f_s\left(\mathbf{y}_n \middle| \mathbf{X}, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right)}{\sum_{s=1}^{S} \lambda_s f_s\left(\mathbf{y}_n \middle| \mathbf{X}, \boldsymbol{\beta}_s, \boldsymbol{\Sigma}_s\right)}, \qquad (8)$$

where $\sum_{s=1}^{S} p_{ns} = 1$, and $0 \le p_{ns} \le 1$.

The expectation and maximization steps of this algorithm are alternated until convergence of a sequence of log-likelihood values is obtained.

2.2. The Criteria

Retaining the right number of market segments as long been a practical issue confronting marketing researchers who use mixture regression models to identify groups of homogeneous consumers that have clear marketing strategy potential. To guide them on this decision, we aim at comparing the performance of 13 information criteria and 14 classification-based criteria, described subsequently, through a simulation experiment. Information Criteria attempt to balance the increase in fit obtained against the larger number of parameters estimated for models with more clusters. As the likelihood increases with the addition of a component to a mixture model, these criteria account for over-parameterization assuming the general form $\mathrm{IC}_{(s)} = -2\ln L + dk_{(s)}$, where $k_{(s)}$ is the number of parameters associated to a solution with *S* clusters and *d* is some constant or the "marginal cost" per parameter (Bozdogan, 1987). Information Criteria are a general family, including criteria that are estimates of (relative) Kullback-Leibler distance, approaches that have been derived within a Bayesian framework for model selection and those named consistent criteria. However, it is also important to ensure that the segments are sufficiently separated to the selected solution. To evaluate the ability of a mixture model in providing well-separated clusters, an entropy statistic can be used to evaluate the degree of separation in the estimated posterior probabilities. This approach yields the Classification Criteria. Some measures are derived in the context of mixture models and other are "imported" from the fuzzy literature (Bezdek *et al.,* 1997). Accordingly, the quantities p_{ns} are interpreted as partial memberships in the context of fuzzy indices and as probabilities of membership in the context of probabilistic indices. The reader is referred to the references cited below (Table 1) for a detailed discussion of the theoretical underpinnings of the criteria compared in this study.

2.3. Previous simulation studies

Few comprehensive studies have been published focusing on the segment retention problem in mixture regression models of normal data. The first work, by Hawkins *et al.* (2001), examined the performance of 12 base criteria, namely AIC (Akaike, 1973), AIC_3 (Bozdogan, 1994), MDL (Rissanen, 1986, 1987), ICOMP (Bozdogan, 1993), CL, NEC (Celeux and Soromenho, 1996), PC (Bezdek, 1981), AWE (Banfield and Raftery, 1993), MIR (Windham and Cutler, 1992), ALL, ANC, WID (Cutler and Windham, 1994) by varying the number of mixture components, the degree of separation between components and the mixing proportions. The authors concluded that PC was the least successful criterion and report good results for MDL and AWE. The study by Andrews and Currim (2001) compared the performance of AIC (Akaike 1993), AIC_3 (Bozdogan, 1994), BIC (Schwartz, 1978), CAIC (Bozdogan, 1987), ICOMP (Bozdogan, 1993), NEC (Celeux and Soromenho, 1996) and the validation sample log likelihood (Andrews and Currim, 2001a) manipulating eight data characteristics, namely: true number of segments, mean separation between segment coefficients, number of individuals, number of observations per individual, number of predictors, error variance, minimum segment size and measurement level of predictors. The authors found that AIC_3 is the best criterion to use with mixture regression models. The work by Sarstedt (2008) evaluated how the interaction between sample size and number of components affects the performance of the four most used criteria used in market segmentation according to a meta-analysis study - AIC (Akaike, 1973), AIC3 (Bozdogan, 1994), CAIC (Bozdogan, 1987) and BIC (Schwartz, 1978). The author concluded that AIC shows an extremely poor performance and that AIC_3 outperforms the other considered criteria across all simulation experiments. Moreover, using AIC may not provide satisfactory performance, especially when the sample size is small and tend to fit too many components (*i.e.*, overcluster).

Table 1. Information Criteria and Classification Criteria

	Criteria	Description	Reference
INFORMATION CRITERIA		*Kullback-Leibler Estimators*	
	Akaike Information Criteria	$\mathrm{AIC} = -2\ln L + 2k$	Akaike (1973)
	Modified AIC 3	$\mathrm{AIC}_3 = -2\ln L + 3k$	Bozdogan (1994)
	Modified AIC 4	$\mathrm{AIC}_4 = -2\ln L + 4k$	Bozdogan (1994)
	Small sample AIC	$\mathrm{AIC}_c = \mathrm{AIC} + \left[2k\left(k+1\right)\right] / \left(N-k-1\right)$	Hurvich and Tsai (1989, 1995)
		Bayesian Criteria	
	Bayesian Information Criteria	$\mathrm{BIC} = -2\ln L + k\ln N$	Schwartz (1978)
	Adjusted BIC	$\mathrm{ABIC} = -2\ln L + k\ln\left[\left(N+2\right)/24\right]$	Yang (1998)
		Consistent Criteria	
	Consistent AIC	$\mathrm{CAIC} = -2\ln L + k\left[\left(\ln N\right)+1\right]$	Bozdogan (1987)
	CAIC with Fisher Information	$\mathrm{CAICF} = \mathrm{AIC} + k\log N + \log\left\|\mathbf{F}\right\|$	Bozdogan (1987)
	Information Complexity Criterion	$\mathrm{ICOMP} = -2\ln L + k\ln\left[tr\left(\mathrm{F}^{-1}\right)/k\right] - \ln\left\|\mathbf{F}\right.$	Bozdogan (1994)
	Hannan –Quinn	$\mathrm{HQ} = -2\ln L + 2k\ln\left(\ln N\right)$	Hannan and Quinn (1979)
	Minimum Description Length 2	$\mathrm{MDL}_2 = -2\ln L + 2k\ln N$	Liang, Jaszczak and Coleman (1992)
	Minimum Description Length 5	$\mathrm{MDL}_5 = -2\ln L + 5k\ln N$	Liang Jaszczak and Coleman (1992)
CLASSIFICATION CRITERIA		Fuzzy Indices	
	Partition Coeficient	$\mathrm{PC} = \sum_{n=1}^{N}\sum_{s=1}^{S} p_{ns}^2 / N$	Bezdek (1981)
	Partition Entropy	$\mathrm{PE} = \left[\sum_{n=1}^{N}\sum_{s=1}^{S} p_{ns}\ln p_{ns}\right] / N$	Bezdek (1981)
	Normalized Partition Entropy	$\mathrm{NPE} = \mathrm{PE} / \left[1 - S/N\right]$	Bezdek (1981)
	Nonfuzzy Index	$\mathrm{NFI} = \left[S\left(\sum_{n=1}^{N}\sum_{s=1}^{S} p_{ns}^2\right) - N\right] / \left[N\left(S-1\right)\right.$	Roubens (1978)
	Minimum Hard Tendency	$\mathrm{Min}_{ht} = \max_{1\le s\le S}\left\{-\log_{10}\left(T_s\right)\right\}$	Rivera, Zapata and Carazo (1990)
	Mean Hard Tendency	$\mathrm{Mean}_{ht} = \sum_{s=1}^{S} -\log_{10}\left(T_s\right) / S$	Rivera, Zapata and Carazo (1990)
		Probabilistic Indices	
	Entropy Measure	$\mathrm{Es} = 1 - \left[\sum_{n=1}^{N}\sum_{s=1}^{S} -p_{ns}\ln p_{ns}\right] / N\ln S$	DeSarbo, Wedel, Vriens and Ramaswamy (1992)
	Logarithm of the partition Probability	$\mathrm{LP} = -\sum_{n=1}^{N}\sum_{s=1}^{S} z_{ns}\ln p_{ns}$	Biernacki (1997)
	Entropy	$\mathrm{E} = -\sum_{n=1}^{N}\sum_{s=1}^{S} p_{ns}\ln p_{ns}$	Biermacki (1997)
	Normalized Entropy Criterion	$\mathrm{NEC}\left(s\right) = \mathrm{E}\left(s\right) / \ln L(s) - \ln L(1)$	Celeux and Soromenho (1996)
	Classification Criterion	$\mathrm{C} = -2\ln L + 2\mathrm{E}$	Biernacki and Govaert (1997)
	Classification Likelihood Criterion	$\mathrm{CLC} = -2\ln L + 2\mathrm{LP}$	Biernacki and Govaert (1997)
	Approximate Weight of Evidence	$\mathrm{AWE} = -2\ln L_c + 2k\left(3/2 + \ln N\right)$	Banfield and Raftery (1993)
	Integrated Completed Likelihood – BIC	$\mathrm{ICL\text{-}BIC} = -2\ln L + 2\mathrm{LP} + k\ln N$	Biernacki, Celeux and Govaert (1998)
	ICL with BIC approximation	$\mathrm{ICOMPLBIC} = -2\ln L + 2\mathrm{E} + k\ln N$	Dias (2004)

3. Experimental Design

3.1. The data

As our goal is to assess how segment retention criteria behave in recovering small market segments, the experiment is based on what we label the group satellite case (see Figure 1): two large and well-separated market segments (named the independent and the main group) and one small market segment (named the satellite group in relation to the main group), with a degree of separation small, medium or large to the main group. As benchmarking case we consider two well-separated clusters with equal size. This second data enables us to evaluate in what extend segment retention criteria loose performance when we add a small market segment to the market segmentation solution.

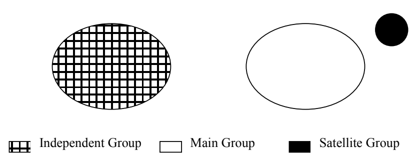

Figure 1. Satellite Group Case

In this experiment we consider six predictors, three continuous and three binary, 300 individuals with 10 observations per individual (yielding 3000 observations per data set) and an error variance of 20%. We first computed, for each subject *n* and all replications: $\mathbf{U}=\mathbf{X}\boldsymbol{\beta}$; subsequently we added an error termto these true values $\mathbf{U}$, $\mathbf{Y}=\mathbf{U}+\boldsymbol{\varepsilon}$; the variance of the error term was obtained from (9) (Wittink and Cattin, 1981, Vriens *et al.*, 1996):

$$PEV = \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2+\sigma_u^2} \Rightarrow \sigma_\varepsilon^2 = \left(\frac{PEV}{1-PEV}\right)\sigma_u^2 \quad (9)$$

where PEV is the percent of error variance, σ_u^2 is the variance of $\mathbf{U}$ and σ_ε^2 is the variance of the error term $\boldsymbol{\varepsilon}$.

The mean separation between the segment coefficients is set large between the independent and the main group, and large (l), medium (m) or small (s) between the main and the satellite group, as detailed subsequently. We first randomly generate the vector of parameters for the main group $\boldsymbol{\beta}_{Main}$ in the range of -1.5 to 1.5. Next, we compute a vector of separations with mean 1.5 (δ_l), 1.0 (δ_m) or 0.5 (δ_s) and standard deviation 10% of the mean. Then, we generate a vector of sign $\mathbf{S}_-^+$ for $\boldsymbol{\delta}_i$, $i=l,m,s$, yielding segments that are not more sensitive than the others in every way. We then compute a vector of coefficients for the Satellite Group $\boldsymbol{\beta}_{Sat} = \boldsymbol{\beta}_{Main} + \mathbf{S}_-^+\boldsymbol{\delta}_i$, $i=l,m,s$ (element by element) and a vector of coefficients for the Independent Group $\boldsymbol{\beta}_{Ind} = \boldsymbol{\beta}_{Main} - \mathbf{S}_-^+\boldsymbol{\delta}_l$. Although we considered minimum segment sizes to the satellite (5% to 10%), main (40% to 50%) and independent (40% to 55%) groups, the segment size is randomly generated in these ranges.

The likelihood function was maximized using the EM algorithm implemented into the Gauss package that was run repeatedly with three replications in order to avoid its convergence to local maxima. Then, for each number of mixture components, the best solution was retained.

For simplicity, we named each experimental design with the following notation Design Type (group satellite - GS or benchmarking - B)/Degree of separation between the main group and the satellite group (large – L, medium – M or small - S).

3.2. Performance Measures

We evaluate the performance of segment retention criteria by their success rate, or the percentage of datasets in which the criteria identify the correct number of segments; we also consider the over fitting rate and the under fitting rate. Given two criteria with similar success rates, we prefer the under fitting to the over fitting. Indeed, empirical results show that over fitting produces larger parameters bias than under fitting does (Andrews and Currim, 2003a,b), sometimes produce very small segments with large or unstable parameter values (Cutler and Windham, 1994) and may result in fitting spurious regressions in non-existent components (Naik, 2007). Moreover, from a managerial stand point in this specific experiment, a solution with 2 market segments where the consumers belonging to the group satellite case are assigned to the main group seems to make more sense than a solution with 4 segments.

3. Results

Table 2 shows the success rates (S), rates of over fitting (O) and rates of under fitting (U) for the four designs. As example, to the GS/L experiment AIC correctly identified the true number of segments in 58% of data sets, over fitted the number of components in 40% of the data sets and under fitted the number of components in 2% of these data sets.

Table 2. Rates of underfitting (U), success (S) and (O) overfitting by design

	CRITERIA	B/-	GS/L			GS/M			GS/S		
		S	**U**	**S**	**O**	**U**	**S**	**O**	**U**	**S**	**O**
INFORMATION CRITERIA	AIC	76%	2%	58%	40%	3%	52%	45%	18%	34%	48%
	AIC_3	99%	18%	78%	4%	37%	59%	4%	33%	34%	33%
	AIC_4	100%	18%	77%	5%	35%	61%	4%	41%	33%	26%
	AICc	76%	2%	59%	39%	3%	52%	45%	18%	34%	48%
	BIC	100%	18%	77%	5%	34%	61%	5%	74%	18%	8%
	ABIC	100%	16%	77%	5%	35%	61%	4%	66%	33%	1%
	CAIC	100%	18%	77%	5%	34%	60%	6%	84%	11%	5%
	CAICF	100%	23%	59%	18%	21%	58%	21%	47%	20%	33%
	ICOMP	90%	4%	56%	40%	5%	60%	35%	28%	31%	41%
	MDL_2	100%	17%	77%	6%	26%	59%	15%	97%	3%	0%
	MDL_5	100%	24%	71%	5%	71%	29%	0%	100%	0%	0%
	HQ	100%	18%	77%	5%	35%	61%	4%	44%	31%	25%
CLASSIFICATION CRITERIA	E_s	94%	36%	55%	9%	95%	4%	1%	91%	8%	1%
	E	100%	69%	29%	2%	99%	1%	0%	97%	3%	0%
	LP	100%	65%	33%	2%	96%	3%	1%	96%	4%	0%
	AWE	100%	14%	77%	9%	36%	56%	8%	99%	1%	0%
	NEC	92%	45%	53%	2%	98%	2%	0%	92%	8%	0%
	CL	64%	9%	40%	51%	5%	42%	53%	21%	35%	44%
	CLC	81%	13%	48%	39%	5%	48%	47%	27%	29%	44%
	ICLBIC	100%	13%	77%	10%	26%	61%	13%	87%	10%	3%
	ICOMPLBIC	100%	13%	77%	10%	19%	60%	21%	91%	7%	2%
	PC	94%	66%	27%	7%	98%	2%	0%	94%	6%	0%
	PE	91%	69%	19%	12%	74%	26%	0%	78%	19%	3%
	NPE	91%	69%	19%	12%	75%	25%	0%	78%	19%	3%
	NFI	87%	65%	20%	15%	69%	30%	1%	71%	28%	1%
	$MEAN_{ht}$	96%	45%	49%	6%	95%	3%	2%	94%	5%	1%
	MIN_{ht}	73%	45%	33%	22%	50%	33%	17%	52%	32%	16%

As expected, all the criteria perform better in the benchmarking case than in the group satellite case. Indeed, almost all criteria exhibit high performance rates for two well separated segments with equal samples sizes, ranging from 64% to 100%.

The results also revealed that almost all criteria have higher success rates for larger separation rates between the main group and the satellite group.

In general, the information criteria AIC_3, AIC_4, HQ, BIC, ABIC, CAIC and the classification criteria ICL and ICLBIC have the best overall performance in recovering a small market segment. The criteria AIC, ICOMP, CL and CLC present the undesirable tendency to overestimate the number of components, and fuzzy indices and some probabilistic indices exhibit high rates of under fitting.

4. Conclusion

As the correct number of segments is unknown in market segmentation applications, a though understanding of measures that guide model selection decision is of fundamental importance. Indeed, if managers take the wrong measure into consideration, their decisions may be misguided. Since previous studies point out that market characteristics affect the accuracy of segmentation retention criteria, this study addressed a special market condition not considered in previous studies, that is considering into the same simulated sample market segments with different degrees of separation and different sizes. Indeed, this study offers researchers and practitioners with a better understanding of the effectiveness of 27 criteria in recovering small market segments.

It is generally clear from comparing the results of this study to those of Andrews and Currim (2003a), Hawkins et al., 2001 and Sarstedt (2008) that almost all criteria perform well when there are two well separated market segments with the same sample size. The presence of a niche market adds complexity to the decision. However, most of the information and classification criteria observe improvements in average accuracy rates for a larger separation between the main and the group satellite case.

Our simulation results revealed that both information criteria - AIC_3, AIC_4, HQ, ABIC, BIC and CAIC - and classification criteria - ICLBIC, ICOMPLBIC - are the best segment retention criteria to recover small niche segments. This result is consistent with Hawkins (1999: 70) who stated that "*augmented complete log likelihood functions may be the next generation of measures for investigation*". However, some of these criteria (*i.e.*, AIC_3, AIC_4, HQ, ICLBIC, ICOMPLBIC) are rarely applied in the market segmentation literature (Sarstedt, 2008). Furthermore, the accuracy of AIC_3 is being consistent in different studies addressing different data characteristics in mixture regression models for normal data (Andrews and Currim, 2003; Sarstedt, 2008).

As researchers rely on heuristics as information and classification based criteria to guide them on the selection of the number of market segments to pick, a thorough understanding of the performance of these measures across different data characteristics is of utmost importance. We also emphasize the importance of applying criteria to decide the adequate number of segments that have been validated, given that results can be substantially different depending on the choice of method in practice. We also maintain that there is significant room for improvement in current practice and that more research is necessary, to be confident in recommending the most appropriate criteria or set of criteria. In fact, this work could be extended by considering other scenarios characterized by two or more niche markets.

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Tourism Destinations and Local Rental: A Discussion around Bureaucracy and Anti-commons. Algarve Case (Portugal)

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Abstract **– Local rental in such an important tourism destination - as it is Algarve region (Portugal) - is a very important economic activity in this region, involving a very large number of owners, intermediaries (many are foreign agencies) and users. Traditionally, a large part of this activity is not caught by the fiscal system. In this work, anti-commons framework is used to analyse the situation of bureaucracy for the segment of local rental in Algarve region in Portugal. This work analyses a specific situation in which government creates new rules for bringing to legality a set of houses and apartments that have been traditionally out of the tax system, usually rent in a short duration system to tourists. Many people are questioning now if this new position of the Portuguese Government to create new legislation is an overreaction to an illegal situation, by creating again an excess of rules and administrative procedures, in a bureaucratic muddle. However, although the final result is not clear, it seems, in a previous version of the legislation to be approved in the Portuguese National Parliament, that the new law brings some procedural simplification and less bureaucracy in a set of procedural processes, allowing to overcome a problem for this area that normally is chronic in Portugal. Yet there are specific rules necessary to guarantee quality standards. Will be them the strictly necessary or continue them to be excessive and even some more procedural diligences are introduced?**

Keywords – Tourism, Tourism Destination, Local Rental, Anti-commons, Algarve, Portugal.

1. Introduction

The present study is based on anti-commons framework and on tourism economics. Heller (1998) has made "the tragedy of the anti-commons" a popular expression since the term has been presented by Michelman (1982). Since then, anti-commons theory has been used to a large set of situations and debated in several academic disciplines. It has been discussed within the property law area and assorted boundaries have been studied for the concept.

Heller (2008) presents many examples of anticommons in diverse legal fields in many countries around the world. Although Heller (2008) views are considerably powerful in the debate of many legal, social and economic situations, they have been object of many criticisms (see for example Claeys, 2011; or Epstein, 2011). Heller (2008) himself notes that anticommons theory is now well established, but empirical studies have yet to catch up. Heller states that there is a free market paradox: usually, private ownership creates wealth, but too much ownership has the opposite effect – it creates gridlock. When too many people own pieces of one thing, cooperation breaks down, wealth disappears and everybody loses.

In this sense, Buchanan and Yoon (2000) have presented diverse bureaucratic situations in which anti-commons theory may be applied. Moreover, anti-commons have been recently considered also to be applied to tourism. One of the ways may be to use it for analyzing bureaucracy in tourism destinations, for example. Anyway, coordination and cooperation are often used to show how anti-commons problems may be solved. Although, there are exceptions on cooperation's benefits, for example, when the transaction costs are too high or too many rights holders exist.

The growing economic importance of tourism conducted to a fast development of Tourism Economics over the last two decades. Tourism is internationally a key industry and the most important sector in many economies. According to the United Nations World Tourism Organisation (UNWTO), over the past six decades, tourism has experienced continued growth and diversification to become one of the largest and fastest growing economic sectors in the world. The World Travel and Tourism Council (WTTC) estimate

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that tourism contributed 9.2 per cent of global GDP and forecasts that this will continue to grow at over 4 percent per annum during the next ten years to account for some 9.4 per cent of Gross Domestic Product (GDP) – WTTC (2010), cited in Dwyer and Spurr (2010). Over time, an increasing number of destinations have opened up and invested much in tourism development, turning modern tourism into a key driver for socioeconomic progress (Dwyer and Spurr, 2010). In fact, tourism has become a global force in terms of economic growth and regional development and holds a mix of benefits and costs, making an important contribution to tourism policy, planning and business practices.

The specific situation of Algarve (Portugal), for example, may be presented as one of the best destinations on the area of beach and golf segments. In this region, tourism has become the most important activity for the regional economy[1]. Algarve is internationally recognized as Portugal's main tourism destination, allowing the relax and joy of the golden sandy beaches, the beautiful design and quality of the golf courses, the pictorial villages and the taste of seafood in the regional restaurants. The weather, in general, is enjoyable all the year and there are excellent tourism facilities.

In this paper, anti-commons theory is presented and a discussion over the tourism problems involving this theory on bureaucracy problems is made, having Algarve (Portugal) as scenery to analyze this situation. The aim is to show that, based on the experience, it is possible to learn and to improve wealth reducing the bureaucratic barriers and the number of exclusion rights assigned to a set of agencies, who deliberate on the procedures needs, procedures circuits, procedures' verification and, in general, participate on the approval processes.

2. Anti-commons Theory and Tourism

There is an old discussion around property rights. Property rights are constantly investigated once much discussion may happen from the difficult definition of the boundaries of several property rights situations. As stated in Coelho, Filipe and Ferreira (2009), ambiguous concepts blur analytical and policy prescription clarity. For the analysis of this subject and clarification of the conceptualization on this area, see Filipe (2006), Coelho, Filipe and Ferreira (2009) or Filipe, Ferreira and Coelho (2011).

In property rights field, it is possible to define the actions that individuals can take in relation to other individuals regarding one object: if one individual has a right, someone else has the corresponding duty to match that right.

Anti-commons theory has appeared representing the idea of an excessive partition of property rights. This theory has appeared in the 80's of last century, introduced by Michelman (1982). In the last years of the 20th Century several ideas about this new problem around property rights have emerged in which too many rights of exclusion and a reduced level of utilization of the resource are present. Many examples have been given in the areas of pharmaceutics, intellectual property, or natural resources, for example. When Michelman (1982) presented the notion of "anti-commons", he defined it as "a type of property in which everyone always has rights respecting the objects in the regime, and no one, consequently, is ever privileged to use any of them except as particularly authorized by others". Considering the anti-commons conceptualizing, Buchanan and Yoon (2000) wrote that the anti-commons concept helps to explain how and why potential economic value may disappear into the "black hole" of resources underutilization.

The description of the "anti-commons" settings makes evidence of the lack of efficiency in several situations in which each one of several owners with property rights over a given resource has no effective rights to simply use the resource (and also, each one has the right to exclude other agents from its utilization) or to use it properly.

If property rights are too dispersed and complementary factors owners are unable to come up with efficient agreements, a "tragedy of the anti-commons" may happen (Heller, 1998; Bergstrom, 2010).

As seen in Filipe (2014) anti-commons tragedies conceptualization allow to join, in a unifying framework, a construction that reflects a set of coordination failures in very distinct areas, such as patents, telecommunications, eminent domain, tourism, pharmaceutics, intellectual property, natural resources or bureaucracy, for example. Overcoming these failures may be difficult, often brutal, but solutions can be got, by understanding the problems and finding the solutions on the available set of

[1] Tourism and related services are around two third of the regional economy.

strategies for agents, sometimes considering administrative solutions to overcome the problem. The ability for one person to veto a solution drastically increases the obstacles to get a solution. Vanneste *et al* (2006) say that anti-commons may well lead to 'disaster'.

In Tourism Economics the discussion around anti-commons in tourism can be found recently for authors as Candela and Figini (2010), Andergassen, Candela and Figini (2013), Candela, Figini and Scorcu (2006) or Álvarez-Albelo and Hernández-Martín (2009), for example. Candela and Figini (2010) show that a tragedy of anti-commons may, in fact, be present in tourism, once three dimensions of the coordination problem may be taken into account on this area: the coordination in quantities, the coordination in quality and the coordination in prices (for more details see Candela and Figini, 2010). The Ammaia specific project in Portugal allows a discussion around this subject of anti-commons problems (see Filipe, 2014).

3. Algarve as Tourism Destination

3.1 The territory, its geographic and administrative division and the economy

With a total area of 4,995 square kilometres, the Algarve is the most southern region of Portugal. Occupying 5.4% of the total area of the national territory, this region borders Alentejo to the north, to the east it is separated from the Spanish Community of Andalusia by the Guadiana River and the west by the Atlantic Ocean. In spite of being a small region, the Algarve occupies approximately one fourth of the coastline of the Portugal mainland. The quality and diversity of its natural resources, generally well preserved, are recognized internationally. The city of Faro is the capital of the region. The Algarve is divided into 16 municipalities (Albufeira, Alcoutim, Aljezur, Castro Marim, Faro, Lagoa, Lagos, Loulé, Monchique, Olhão, Portimão, São Brás de Alportel, Silves, Tavira, Vila do Bispo and Vila Real de Santo António). Algarve has natural characteristics associated with its geology, quite unique to the region, being possible to identify several "sub-regions", which are associated with different economic activities.

The "Serra" (Mountains) is almost an amphitheatre open to the ocean that separates the Algarve coast from most of the rest of Portugal. It is in this region that most of the more traditional activities are developed in Algarve, usually attached to forest resources and some agriculture, with a low rate of human occupation and occupied by the older generation.

The "Barrocal" zone is the intermediate zone (between the coast and the mountains), it has very favorable conditions for the development of some agricultural activities and close to major urban centers, it has become a very attractive region for locating economic activities.

The region further south is the "Litoral" area (coastline) is the most sought for the development of economic activities (predominantly related directly or indirectly to tourism, since this is the main engine of the regional economy) or the largest source of employment.

In the extreme east and west of the region there are the "Costa Vicentina" and "Baixo Guadiana" areas, both with low levels of employment, in general employments held by older people (over the Baixo Guadiana) and with weak economic dynamics and usually closely associated with the endogenous resources of the primary sector.

3.2 Algarve – An Important Tourism Destination

In general, the theoretical developments in Tourism Economics are based on the systemic nature of tourism and on the big heterogeneity of the tourism activities. Tourism presupposes a strong net of relationships among the economic agents in a complex system of interactions among local, regional and national levels of governmental agencies, firms, tourists and residents. In this sense, tourist products necessarily include a set of heterogeneous and complementary goods and services, supplied by firms belonging to different industries which are mainly, but not exclusively, located in the tourism destination.

In Algarve many activities depend on tourism. Many tourism products are provided and a strong demand is got each year. Particularly, since the 1960s, Algarve has become an important destination for European people. Algarve became a very popular destination for tourists, mainly from Britain. Since then, it has become a common destination particularly for Germans, Dutch and Irish people. Many of these tourists have their own properties in this region. There are Algarve-based English-written publications and newspapers specifically addressed to this community. In addition to the natural beauties and ample beaches, the Algarve has invested in the creation of a network of golf courses. The Algarve is a popular destination, largely due to the beaches - many of them very well known abroad - a Mediterranean climate, safety conditions, a tasty cuisine and also relatively low costs. It is also popular for religious tourism.

Algarve's gentle climate attracts the interest from Northern Europeans wishing to have a holiday home or residence in this region. Considering that Algarve is a region of Portugal, and therefore belongs to the European Union, any EU citizen has the right to freely buy property and reside with little formality in the Algarve. British, followed by German, Dutch and Scandinavians, are among the largest groups wishing to own a home in this sunny region of Portugal.

Tourism plays an important role in the economy of the Algarve. A large number of seasonal job opportunities are tourism-related and are fulfilled by many immigrant workers from countries like Brazil, Ukraine and Cape Verde, among others.

In March 2007, the Minister of Economy, Manuel Pinho, announced the creation of the "Allgarve" brand, as a part of a strategically promotion of the Algarve as a tourism destination for foreign citizens.

Additionally, many owners that have a second house or are away for any reason intend to rent their properties. As the region is very demanded for tourism the rental sector became very attractive.

Taking into account that the tourist destination is, in essence, a travel destination that gets the attention of a large numbers of tourists, visitors may come to visit these destinations to enjoy the beaches, to see historical sites, natural wonders, etc. Some tourist attractions also include many activities and souvenirs that are often got on these destinations. In tourism, the "space" plays a fundamental role (Leiper, 1990), being Algarve recognized as a beautiful and warm place to enjoy the space, reason by which it is a very strong tourism destination in several segments.

In Leiper (2004), tourist destinations are defined as "places where travelers choose to stay a while for leisure experiences, related to one or more features or characteristics of the place – a perceived attraction of some sort". According to the view of Cooper *et al* (2008) for territorial system, Algarve represents a territorial system supplying tourism products to satisfy the complex tourists' demand needs. Accordingly, Algarve has a sort of common features as destination region providing a variety of touristic products, allowing significant economic value accumulation for the regional economy.

Considering the features of Algarve destination, there are some interesting notes about, namely:

- In the region there is a significant tourism seasonality, being the demand for beaches the main strength of Algarve tourist economy.

- Sometimes an important part of the Algarve carrying capacity is reached, mainly in several specific areas of the region. In these circumstances, the overuse of specific common resources creates unsustainable conditions for a pleasant use of these common resources.

- Often, tourists and residents compete for a limited amount of available resources. In the region it is usual that in some seasons, particularly in Summer season, goods become more expensive considering the strong demand, and also the conditions for using the beaches become worse and often an overcrowded capacity is reached.

- There is anyway a different sort and variety of products offered in the region which compose the "regional tourism product", often being of different segments but trying to get homogeneous products for these specific segments what allows to preserve specific products in the region, targeting different touristic publics. This offer allows to guarantee a compatible quality permitting to get the economic success of the different products in the region destination.

- As Andergassen, Candela and Figini (2013) point out - and matched for Algarve - tourism supply meets demand in the destination; environmental and cultural resources, attractions and the hospitality industry are located in the destination; the demand for tourism is revealed in the destination; tourism destination is the conceptual link between:

    - the complexity of the sector, the complementarity and substitutability of the many goods and services of which the tourism product consists,

- o and the supply of available local resources.

Algarve has reached an important position in the international context of tourism destinations, pleasing the demand in the different requesting contexts. Considering that there has been a strong specific demand for local rental sector, matched by different kinds of offer (apartments, houses, villas, hostels,…), the main point is now to reflect about what will happen with the legal changes in the sector, considering the proposal of Portuguese Government for Local Rental regulation.

4. Local Rental Sector

4.1 A New Legal Framework Scenario for Local Rental Sector in Portugal

Learning from past experiences, it is usual to say that in Portugal the bureaucracy mines activities, the business creation processes and the procedural requirements needed for economic activities. It is usual that administrative procedures create a web of customs that bring difficulties for those who want to develop activities, also often too many documents are needed to cope with the current life situations.

In general, administrative procedures are exaggerated and bring economic problems leading people to lose a lot of time with administrative matters which in general are absorbing too much time and resources. Some cases are often singled out as paradigmatic as construction licenses, projects approval in various areas, namely aquaculture or in restoration, the creation of enterprises, etc. There is a wide background and experience of excessive bureaucratic procedures in Portugal which in general have brought very bad economic results.

In the present case study of local rental in Algarve, lawmakers seem to want less bureaucracy in this sector. Registration of local accommodation will become mere prior communication to the City Halls (according to the previous version of the new Decree-Law ruling this sector). Anyway Portuguese Government is fixing a maximum of nine apartments for rent and provides for fines up to 35 thousand euro, according to this prior version of the Decree-Law for illegalities.

Local rental is already under the previous Portuguese Legislation. The figure of the local accommodation was created by Decree-Law No. 39/2008[2], to enable the provision of temporary accommodation services in establishments which do not meet the requirements legally required for tourist resorts (for the purposes of that Decree-Law). According to it, the registration of the local accommodation is yet required and is a responsibility of local authorities.

In the expression local accommodation establishments (in Decree-Law nº 39/2008) were considered the villas, apartments and other accommodation establishments with authorization to provide temporary accommodation services, with remuneration, but not meeting the requirements to be considered as tourist resorts. The local lodging establishments had to comply with the minimum requirements of safety and hygiene set by joint Ordinance of government officials responsible for the areas of tourism and local administration.

The local accommodation establishments which met the requirements provided had to be registered at the Town Hall of the respective area. Only the local accommodation establishments registered in the Town Halls of the respective areas could be marketed for tourist purposes either by their owners or by travel agencies and tourism. The municipalities had to provide to the *Turismo de Portugal, I. P.*, the computer access to the register of local accommodation. The establishments referred to in this Decree-Law had to identify as local accommodation and could not, under any circumstances, use the qualification of tourism, nor any system of classification.

Considering these specifications, there is a set of legal procedures which make that often only a part of entities that explore the business in a structured way are under the fiscal system and have the business formally created. Many situations in the sector exist for which the activity is not legalized and consequently they pay no taxes.

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[2] This Decree-Law established the legal regime of installation, exploitation and operation of tourist resorts, by revocation of the various diplomas that previously regulated this matter and by bringing together in a single law the provisions common to all activities in this area. This Decree-Law intended a flexible classification system. However it enforced a set of minimum requirements for each category and enumerated a set of optional requirements allowing to achieve the score needed to obtain certain category. At the same time, the requirements for periodic review of the rating were introduced, predicting a quality control performed not only by tourism offices but also by other accredited entities for this purpose.

The Portuguese Government is now creating new rules and creating new penalties for infractions. Simplifying and "debureaucratizing" the rules of local accommodation is the buzzword in the new law that is being prepared by the Portuguese Government. Among the new rules under consideration is the transformation of the current registration of houses for rent to tourists in a mere advance notification addressed to City Hall. But each owner will be able to explore just nine apartments, otherwise falls on the law of tourist resorts.

As mentioned above, the strengthening of fines is also an aim of the Portuguese Government: the accommodation locations that are not registered or with outdated records risk fines between 3,741 and 35 thousand euro, depending on whether being individuals or corporations.

The new legal framework creates a new type of establishment, the "guest-house" - part of a house or an apartment rented to tourists.

These are some of the measures included in the latest version of the diploma (Monday, 19th May 2014) that will regulate local accommodation. The new rules will be approved later by the Council of Ministers (expected to be approved by the end of June) and that can still suffer adjustments – are expected to be applied this year, adjusting the properties for rent to tourists to the functioning of the market.

The revision of the legislation seems to respect the principle of reducing the bureaucracy in the tourism sector (the registration will be replaced by a prior communication to the City Hall) and freedom of initiative (the government aim seems not to be limiting or prohibiting the existence of local accommodation; however, theoretically it is difficult to discuss the problem involving politics, which is not anyway the aim of this study).

4.2 The Local Rental Sector in Algarve

As already seen, Algarve is an important destination for Portuguese and for foreign tourists. Accommodation in the Algarve ranges from high rise resorts in places like Albufeira to traditional guesthouses, located in the small towns and villages surrounding the Algarve coast or even apartments or villas. Over the past 50 years the Algarve region has registered an important development, particularly in tourism activities. Over the past few years many tourists visiting Algarve have moved away from the resorts, and have chosen the comfort of a traditional Algarve guesthouse. Many of these people came from England, Holland, or Germany who have escaped to the Algarve region for a higher quality of life.

Algarve has developed the segment of local accommodation once it proved to be very profitable. The tourism demand has reached very high levels and as a result a strong supply for this kind of local rental in the market is a reality (as it is the case for example for apartments).

Besides, it is factual that the vast majority of these rentals do not comply with their tax obligations and has been normally out of the legal system. Once the sector in Algarve is quite important, the tax losses are very significant, being this situation one of the reasons why the Portuguese Government is currently preparing legislation. It intends to bring to the legal system many of these rents in order to tax the incomes that have been away from the legal system and to establish a strong control scheme in what relates to the prevarication on this kind of practices.

5. Discussion

With the new regulation, villas and apartments rented for short periods of time will be entered into a register agency what will facilitate rents control. A new National Register of Local Accommodation (RNAL[3]) is being prepared in order that all the buildings rented to tourists are registered there. This implies a licensing in the Portugal's Tourism Agency[4] and at the same time a declaration of commencement of activity in the Ministry of Finance Department for taxes effects, through the use of a CAE[5] (Economic Activity Code) specifically for this purpose.

The new regulation aims that rentals not declared for taxes purposes may be eradicated, ending tax evasion and unfair competition in the tourism sector. These villas or apartments are frequently advertised on the internet[6] and beyond the control of the Portuguese authorities.

In addition to the supervision by the tax authorities, new requirements such as cleanliness and quality of facilities will be also required, being ASAE[7,8] (Food

[3] *Registo Nacional de Arrendamento Local*.
[4] *Turismo de Portugal*.
[5] *Código de Atividade Económica*.
[6] Often the entities that advertise are international companies that do not pay taxes in Portugal.
[7] ASAE - *Autoridade de Segurança Alimentar e Económica*.

and Economic Security Authority – a branch of the Criminal Police) the entity responsible for the surveillance and inspection of these activities in the sector.

One of the main objectives is to create a kind of mega database of accommodation places, forcing the Local Authorities to send the communications on registration to the Portuguese Tourism Agency *Turismo de Portugal*. In this way this process will facilitate the cross-checks with the taxes authorities that will tax the incomes of this activity in a normal way.

Beyond the tax discussion another matter is considerably important involving the discussion. The excess of rules destroy value as far as the creation of reasonable administrative processes in the system brings new behaviours and a more efficient management of the sector's structures and logistics.

It is possible to enhance value by creating correct requirements to citizens, generating an acceptable level of administrative demanding. Besides, involving a more general analysis, as far as taxes are put in a correct level the sector may develop in a more structured and organized way creating new strands of business development, although if there are not excessive requisites created for the activity.

This legal regime is applied to 4 types of accommodation: apartments, villas, lodging establishments and guest-houses (part of villa or apartment). Nine apartments are the limit for each owner. Otherwise, it will be considered as tourist resort. Apartments registered in the spouse's name, descendants and ascendants of the owner or holder of the exploitation are considered for this effect. These are some of the foreseen measures that apparently intend to supervise the sector efficiently and fairly. Moreover all the measures needed to be accomplished by all the agents involved in the process, if applicable in a sensitive manner, may make the sector to compete fairly and bring add of value for all the parts implicated in the sector operation.

Nevertheless, it is not clear that the administrative procedures will be simplified and that there will be less bureaucracy. The practice will respond to this situation but the last effect is not clear. If some of the processes will not be expedite, the bureaucracy can bring the well known face of losing. Garrido (2014) states that the worst situation may be feared with the legislation expected for the sector: regulation and more regulation, documents coming and going, authorizations in "thousands" of departments. [...] this will destroy the small businesses. The last result will be less income and less innovation, with income gains for the ones who are already installed in the structured part of the activity. In that case, the bureaucracy may be attacking, destroying value and ensuring rents. All this may happen in the guise of combating tax evasion and unfair competition.

In fact, a set of new requisites has to be accomplished by the local accommodation owners. Requirements such as the number of cleanings registration, smoke evacuation equipment, book of complaints or a mandatory card at the door of the house are some of the requirements of the new law (see Garrido, 2014). The ASAE will work together with the Treasury to ensure that these requirements are satisfied.

If there are too many requirements to be satisfied, the costs of renting a house to tourists may increase considerably and in these terms many houses will no longer be available on the market to be rented.

Anyway, the final result is ambiguous and difficult to understand at this moment.

6. Concluding Remarks

In several countries in which tourism is a fundamental activity, the framework of anti-commons is a possible tool to methodologically deal with tourism problems.

Tradition shows that in Portugal the bureaucratic weight is very high. Wealth creation often depends on multiple processes, lengthy administrative circuits and many agents from whom the approval of processes depends on. Decision-making on a set of establishment's licenses and projects' economic exploitation involves too many agents, what brings frequently many problems to effective results achievements when the use of resources is considered within this field.

These excessive administrative procedures lead to heavy losses of value and economic wealth and to the frequent destruction of social projects or inhibition of the development of interesting projects to the communities.

[8] Specialized national administrative authority within the framework of the food security and economic surveillance.

In the case of local rentals, a huge loss of tax revenue has existed in Portugal for long time because homeowners did not legalize their activities in this local rentals business.

Various administrative procedures use to be required but above all the lack of supervision and the lack of effective penalties to offenders have led to this situation. Although the bureaucratic procedures are much more demanding for tourism resorts, requiring the authorisation and inspection of multiple agents, also the process of implementing an accommodation place on local rental system is not easy, and depends on various bureaucratic associated procedures.

Based on the experience, have the Portuguese authorities learned the lesson on the simplification of procedures and decision processes regarding registration and business implementation? Local rental sector is separated from tourism resorts particularly in terms of administrative processes. On that basis, the Government proposes a Decree-law - to be approved by the Council of Ministers, after discussion - which predicts the existence of simpler and more realistic procedural practices. If the Portuguese Government main goal is to obtain greater tax revenue, the truth is that by stimulating the activity a new strand to the formal economy is given, which may correspond to an increase of integrated activities in the region. Anyway, the way procedures will be implemented are not clear for the moment.

A question remains: what will be the final result?

The reduction of procedures in a reverse logic of the tragedy of the anti-commons allows reversing the destruction of wealth that can be seen in many situations when the addition of bureaucracy is evident.

There a “Drama of Anti-Commons” may be seen in the sense that the “tragedy” happens for practical implementation of excessive bureaucratic procedures as well as there may be “comedies” through the reversal of processes, reducing the administrative charges and the decision-making circuits. With the reduction and the reversal of excessive processes, a “comedy” may happen in the sector with an increase in value for the region in terms of the wealth produced and with the integration of activities, broadening the range of beneficiaries of the introduced measures.

On the case of local rental in the present study, the question seems to be kept unanswered. In terms of the theory of anti-commons, a logic of “comedy” can be the corollary of the problem resulting from a learning process that leads to the adoption of a smaller administrative and bureaucratic assignment. But this is not evident yet. The final result will depend on the way the process of implementation of the measures and the way how the control and surveillance system will be working on. In fact, there may be:

- an increase of value/wealth, providing a “comedy” resulted from the inversion of the logic inherent to the processes associated with anti-commons;

- or the contrary, if the administrative procedures rise significantly and difficult the exploitation of the business.

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Mobile Social Networking: An Innovative Approach-A Book Review

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Abstract – **The objective of this work is the book "Mobile Social Networking: An Innovative Approach", 978-1-4614-8578-0, from Springer Series "Computational Social Sciences" review. Alvin Chin and Daqing Zhang, Editors of this book point briefly its main targets as:**

1. **Identify current problems in Mobile Social Networking and propose possible solutions.**
2. **Provide examples of real-life applications that illustrate mobile social networking.**
3. **Demonstrate real-life data extract from deploying the applications in the field.**
4. **Challenge the widely accepted preconceptions of what mobile social networking is within the industry and academic fields.**

The keywords and the related subjects presented below, also supplied by the Editors, give a complete idea about the subjects dealt with in this book and also on the research methodologies used. An innovative approach to this theme is used. The whole book is written in very correct and accessible English. It sounds scientifically rigorous and exigent. The contributors are leading experts in Mobile Social Networking, with high reputation, from academia and industry. According to the Editors, the target audiences are graduate students and researchers, business professionals and CTO's.

Keywords – Data Mining Mobile Social Networking, Ephemeral Social Network, Future of Social Networking, Location-Based Social Network , Mobile Social Networking Applications, New wave of Social Networks, Social Network Data Analytics, Social Networking Smartphone Apps.

Related subjects – Communication Networks, Complexity, HCI, Signals & Communication.

1. The review

Mobile Social Networking is something omnipresent nowadays, with an enormous influence in our social life, in a broad sense. But, in general, that influence is noted for us mainly subconsciously and, consequently, the concept is not clear either in our minds or in its formulation through our own words. In the Preface of this book, the Editors Alvin Chin and Daqing Zhang state that:

"We are now entering a new computing era where mobile computing and social networking connect directly through their mobile phones".

It is comparable to:

"Mobile Social Networking is social networking where individuals with similar interests converse and connect with one another through their mobile phone and/or tablet" (http://en.wikipedi.org/wiki/Mobile_social_network),

but much more poetic.

With this phrase, from an intuitive point of view, the concept becomes clearer. And so we are able to catch how great the influence of this kind of interaction in our life is. It is in fact true that it is one of the, if not even the, symbols of the present time life and, surely, it will be in future.

This is the theme for one of the most important achievements of this book: *"To state the meaning of Mobile Social Networking and to emphasize how omnipresent it is in our life"*. This is pursuit through the whole text.

The Editors point four main targets for this book:

- Identify current problems in Mobile Social Networking and propose possible solutions.
- Provide examples of real-life applications that illustrate mobile social networking.
- Demonstrate real-life data extract from deploying the applications in the field.
- Challenge the widely accepted preconceptions of what mobile social networking is within the industry and academic fields.

That is: simultaneously descriptive and operative.

From the descriptive point of view, in this book, with contributions from sociology, computer science, human-computer interaction and design, it is shown how mobile social networks can be found in user´s physical interactions both with the environment and with others. And also how the users behave around them and how their behavior differs as mobile or traditional online social networks are considered.

From the operative point of view it is shown

1. How applications can be built to provide mobile social networking.
2. The research issues that must be solved to enable this vision
3. How Mobile Social Networking can be used to provide computational intelligence in order to improve daily life in the future.

All this is made through an innovative approach that consists in looking at mobile social networks from the micro point of view: at a particular activity and how this can be recorded and shared easily with online social networks, instead of the usual macro point of view.

The book is composed of ten chapters:

1. Introduction
2. Socially Aware Computing: Concepts, Technologies, and Practices
3. Ephemeral Social Networks
4. Social Behavior in Mobile Social Networks: Characterizing Links, Roles, and Communities
5. Mobile Social Service Design for Special Context
6. Exploiting Personal and Community Context in Mobile Social Networks
7. Enhancing Mobile Social Networks with Ambient Intelligence
8. Data Analysis in Location-Based Social Networks
9. Towards Trustworthy Mobile Social Networking
10. Conclusions

The whole of them make sense all alone and are written in very good and accessible English. They sound scientifically rigorous and exigent.

The contributors are leading experts in Mobile Social Networking, with high reputation, from academia and industry.

According to the Editors, the target audiences are graduate students and researchers, business professionals and CTO's. In fact, the quality of the text makes it accessible either to academics or professionals, either at a beginner or at a senior level.

2. Overall review

This is a wonderful book, innovative, methodological and pedagogical, scientifically rigorous, important in establishing Mobile Social Networks concepts, simultaneously descriptive and operative. Written by highly reputed contributors from academia and industry, it is an essential reading for graduate students and researchers, business professionals and CTO´s. And also for everyone that aims to give the first step in approaching this theme.

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