WORKING PAPER 02/2013

COMPARING AIR TRANSPORT POLICIES FOR SMALL REMOTE COMMUNITIES: U.S.A., CANADA, PORTUGAL, SPAIN AND BRAZIL

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Data de publicació: 16/VII/2013

CÀTEDRA PASQUAL MARAGALL D'ECONOMIA I TERRITORI

COL·LECCIÓ DE DOCUMENTS DE TREBALL

Càtedra Pasqual Maragall
Economia i territori
UNIVERSITAT DE BARCELONA

Entitat col·laboradora:

Santander UNIVERSIDADES

Submitted after review to the "CÁTEDRA PASQUAL MARAGALL"
Metrass-Mendes, de Neufville, Costa, and Oliveira, 2013

COMPARING AIR TRANSPORT POLICIES FOR SMALL REMOTE COMMUNITIES: U.S.A., CANADA, PORTUGAL, SPAIN AND BRAZIL

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This paper examines the regulatory status in the aviation industry, and the efforts of the U.S.A., Canada, Portugal, Spain and Brazil to adopt air transport policies and mechanisms to provide their populations with universal accessibility. A systems engineering grounded theory approach and a cross-national case-based comparison framework are used to look at the impacts of different policies and mechanisms on the air service to small remote communities. It is found that the success of a policy design critically depends on five factors: 1) the joint support of infrastructure investment, maintenance and operations and air services; 2) governments' ability to promote competition and protect passengers in markets where competition does not exist; 3) the operating carrier's choice of business model, technology for thin routes, and network; 4) political interest; and 5) local participation. Based on the evaluation of policy designs and assessment of policies in five substantially different national contexts and interviews with several stakeholders, the authors provide insights and suggest recommendations in small remote air transport policy for policy makers and practitioners. The recommendations are applicable to other countries reforming their aviation industries.

KEYWORDS: Deregulation, air transportation policy, small remote communities, United States, Canada, Portugal, Spain, Brazil.

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1. INTRODUCTION

Governments are expected to ensure cohesion of their territories by sustaining accessibility to all regions, including small and remote communities. In the case where alternative transportation links are scarce or unavailable, air service becomes essential (Reynolds-Feighan, 1995). Typically, governments' role in serving these population centers was facilitated through regulatory provisions (Halpern and Pagliari, 2007, and Williams, 2002). The paradigm shift launched by liberalization of the airline industry, and caused by loosening of control over markets, questions the traditional mechanisms for ensuring equitable air accessibility. As the result, nations worldwide face the challenge of providing air service to small communities under regulatory reforms and conditions. The circumstances provide incentives for air transportation policy design deployment and intervention worldwide.

This paper employs a systems engineering grounded theory methodology to identify various conditions under which transportation policies provide effective and efficient air accessibility to remote areas and the factors that influence the public policy outcomes. We succeed in identifying the world best-practices for air transportation policy making by drawing lessons from national case studies - U.S.A., Canada, Portugal, Spain and Brazil - and insiders' perspectives through interviews with public policy and air transportation professionals. Policy makers can draw several strategic lessons from our research findings.

2. DEREGULATION AND ITS IMPACTS ON REMOTE COMMUNITIES

More than three decades have elapsed since the first national liberalization of the aviation industry and the effects of deregulation on the industry organizational form and air service users have been extensively analyzed in the economic, transportation policy, and geographical literatures within numerous frameworks. To date, the majority of studies have focused on the examination of the air transportation industry organizational form in large or high density markets and many scholars studied various aspects of airline liberalization (Goetz, 2002; Grubesic and Zook, 2007; and Oliveira and Salgado, 2008).

Yet, specific literature on the impacts of liberalization on small remote communities is much scarcer. With regards to air service to small remote communities, the early work of Morrison and Winston (1986), and more recent studies of Reynolds-Feighan (2000, 1996, and 1995), and Metrass-Mendes and de Neufville (2011) offer some valuable initial insights into the

impact of deregulation on the accessibility of these small remote centers. Policy programs for small communities have been analyzed by a few scholars. The impacts and performance of the US policy program Essential Air Service (EAS) were recently studied by Matisziw et al (2012), Grubesic and Wei (2012), and Grubesic and Matisziw (2011). In Europe, the public service obligation mechanism (PSO) to serve small remote communities has been discussed by authors such as Cabrera et al (2011), Calzada and Fageda (2010); and Merkert and Williams (2013).

Because the potential detrimental impacts of liberalization on small remote communities have been a major concern for policy makers, the effects of deregulation are also analyzed by governmental agencies. For example, and since the late 1980s, the US Government Accountability Office (US GAO) has been producing numerous studies and reports on the topic of fare and service changes among small and medium communities (US GAO, 2011; 2002; and 1996), and, in Canada, Transport Canada (TC) has been studying the impacts of national policies on service to small airports (TC, 2009; and 2004).

While the motivation for providing universal air services is clear and there exists research on policy options for providing these services, there is a gap in comparative literature. There is also another clear gap in industrial organization form of low density markets. This paper addresses these gaps by conducting an examination and comparison of the air transportation industry and policies focused on the small remote communities market.

3. METHODS

Regulatory framework and policy programs and the aviation industry influence each other, and there are many factors affecting the outcomes of a policy design. Because this makes establishing causality difficult and theory is still being formed in this area, a grounded theory approach was adopted. An engineering systems approach was proposed and a case-based cross-national comparison design was used to identify best practices in air policy for small peripheral centers. We systematically evaluated support programs taking into account the economic and social dimensions of the problem and utilize quantitative and qualitative tools to address country specificity.

In approaching each community and national context, the following categories served as a guide for gathering information: form of support, In approaching each community context, the following

questions served as a guide for gathering information: 1) form of support; 2) governance, decentralization and local intervention; 3) community; 4) market regulation; and 5) industry structure and age of deregulation.

The system was decomposed into three components that are analyzed at three different levels of observation. At the highest level of observation, the diverse country policies effects on air service provision to small remote communities are compared among nations. One level down, policy mechanisms are analyzed at the country level. Finally, this individual national level is decomposed into the finest grains of analysis – the communities. Analyzing the community level outcomes assisted supporting and validating of the overall conclusions drawn from the analysis on different national policies.

3.1. National cases

The focus of this paper lies in the United States, Canada, Portugal, Spain and Brazil. Four strategies were used in the selection of these cases. First, they were selected because they are relevant, representing the geographic spread of countries that rely on aviation to serve small remote communities. As a consequence of geography, climate, and vast distances, the U.S.A., Canada and Brazil are highly dependent on aviation to transport passengers and freight on a year-round basis to their remote areas. Spain and Portugal, on the other hand, have insular communities sharing remote accessibility issues. The second rationale was to ensure that cases covered different stages of the industry. Each country is at a different phase of deregulation and the industry's development. The U.S.A., for example, who was the pioneer of airline liberalization, presents a mature fully deregulated domestic market. Conversely, Brazil maintains some degree of regulation on a young airline industry, under turbulent development. Third, the countries were chosen for the reason that they use various intervention policies and strategies for delivering universal accessibility. Their approaches to providing equitable air accessibility are not homogeneous: each nation has different institutional structures, regulatory frameworks, and different actors operating within their policies. Finally, for all these five nations it was possible to find enough information about public policy, and to have good data sources.

3.2. Data Sources

Documentary elements used for the policy analysis included industry databases, statistics reports with data on passenger air traffic for specific airports, airport reports, strategic

planning documents, airline reports, government reports on their policies and specific programs, accountability reports on state budget for air transportation and the explicit allocation of funds to small remote, and regulatory documents such as legislative provisions. Descriptive statistics about individual countries, communities, airports and airlines, and institutions were available from different sources, including Government Agencies, and other institutions. This information was complemented with interviews with airport managers, carriers, members of local government authorities and institutions, and community members.

4. NATIONAL PATTERNS OF AIR SERVICE PROVISION

This section examines the set of policy design options implemented for the provision of air service to small remote communities. A comparison - cross-sectional (communities cross country and inside the country) and longitudinal - of the key policy insights obtained from the case-study approach and the interview method is provided. We identified the major policy differences in our five national cases, and account for their different results.

4.1. Form of support

One important distinction between the five countries lies in the form of support of air service development, both in terms of air service and infrastructure provision. Table 1 and Table 2 summarize the major differences and common aspects between the U.S, Canada's, Portuguese, Spanish and Brazilian policies.

Three countries – the U.S., Portugal, and Spain - have specific policy programs for the development of air services for their small remote communities. While the U.S. uses the federal program Essential Air Service (EAS), the European countries adopted the Public Service Obligation (PSO) mechanism. Canada and Brazil do not have formal policy programs for the support of air services, yet Canada supports accessibility with a less formal structure.

The U.S. and European approaches appear to be more consistent and transparent and therefore lead to more efficient mechanisms than the one of Canada. In the U.S., and in PSOs in Portugal and Spain, it is possible to identify exactly which communities are being covered by state support, which is extremely important considering that the main policies' goal is to provide equitable accessibility as well as regional balance and territorial cohesion. In the cases of the U.S. and Portugal, where the carriers give estimates of the fully allocated cost of provision of the service level, the level of transparency is greatly improved.

Financial support to air carriers is provided by four nations: the U.S., Canada, Portugal, and Spain. While U.S. and Portugal offer direct financial compensations to airlines operating thin routes covered by their policy programs EAS and PSO, Canadian policy provides indirect support to carriers through its Department of Indian and Northern Affairs Canada (INAC) that funds Inuit and First Nations fully-owned or joint-ventures carriers with land claim and self-government agreements. Spain does not subsidize carriers serving small remote communities with the PSO mechanism, but offers compensation to airlines willing to serve some small airports. Brazil is the only country that does not currently provide airlines with any support.

Table 1: Cross-national comparison of form of support of air service development

Type of support		U.S.A.	CANADA	PORTUGAL	SPAIN	BRAZIL
Air Service	**Program for support of air service development for small remote communities**	**Yes** (EAS and SCASD)	**No**	**Yes** (PSO)	**Yes** (PSO)	**No**
	Financial support of air carriers	**Yes** (EAS and SCASD)	**Yes**. Indirect financial support. Inuit and First Nations organizations established fully-owned or joint-ventures carriers with funds from land claim and self-government agreements that are negotiated and implemented by Indian and Northern Affairs Canada (INAC)	**Yes** (PSO financial compensations offered to carriers and other non-PSO compensations)[b]	**Yes** (in Spain PSO offers no financial compensation to carriers but some autonomous regions choose to subsidize airlines[c] and there are subsidies for airport fees[d])	**No**

Three countries – Canada, Portugal, and Spain – support travelers through a resident discounted airfare scheme. The Portuguese and the Spanish mechanisms are quite similar[e], while the Canadian differs to some extent in that it is not formally a resident discount but a

[b] In Portugal, carriers are offered compensations on a few non-PSO routes. This is the case of the route Lisbon-Funchal (Madeira) that is operated by the LCC Easyjet.
[c] Even though the Spanish PSO mechanism does not include the financial compensation of carriers, the autonomous governments of several regions have chosen to pay airlines (LCCs and regionals) to develop air services for their communities. Some examples are given by the LCC Ryanair serving the airport of Vitoria (province of Álava) and the regional Air Nostrum serving the case-study airport of Logroño.
[d] Airport fees on domestic routes that link the mainland and the islands are about 40% lower than other Spanish domestic routes, and airports fees on inter-island routes are nearly five times cheaper than on other domestic routes (Calzada and Fageda, 2010).
[e] In Portugal there is a resident and student discount, while in the case of Spain the discount is exclusively for residents.

discount for members of Indigenous communities. In addition, in these three countries and in Brazil, it is the national Health Care System that covers traveling expenses (airfares) of passengers with specific medical needs. These national approaches handle better social assistance compared to the U.S. policy that does not discriminate travelers.

Table 2: Cross-national comparison of form of support of air service development (continued)

Type of support			U.S.A.	CANADA	PORTUGAL	SPAIN	BRAZIL
Air Service	**Traveler support**	Resident discounted airfare scheme	**No**	**Yes** (for members of Inuit and First Nations organizations)	**Yes** (for residents and students of the Portuguese archipelagoes)	**Yes** (for residents of the two Spanish archipelagoes and of the two autonomous cities of Ceuta and Melilla)	**No**
		Other	**No**	**Yes**, for passengers with specific medical travel needs. Airfares are paid by the national Health care system.	**Yes**, for passengers with specific medical travel needs. Airfares are paid by the national Health care system.	**Yes**, for passengers with specific medical travel needs. Airfares are paid by the national Health care system.	**Yes**, for passengers with specific medical travel needs. Airfares are paid by the national Health care system.
Infrastructure	**Program for support of small airport infrastructure**		**Yes** (AIP)	**Yes** (ACAP)	**No**	**No**	**Yes** (PROFAA)
	Financial support of operations, maintenance and capital investments		**Yes** (AIP)	**Yes** (ACAP)	**Yes**. Cross-subsidies for ANA and ANAM airports. Central and regional governments and E.U. funds support for others. E.U. funds.	**Yes**. Cross-subsidies between AENA airports. E.U. funds.	**Yes**. Cross-subsidies between INFRAERO airports. PROFAA for airports managed by municipalities and states.

On the infrastructure side, three countries – the U.S., Canada, and Brazil - have specific policy programs for the support of small airport infrastructure. While the U.S. uses the federal program Airport Improvement Program (AIP), Canada uses its Airports Capital Assistance Program (ACAP) and Brazil the *Programa Federal de Auxílio a Aeroportos* (PROFAA) mechanism.

4.2. Governance, decentralization and local intervention

Another significant difference between the national policies is each government's approach to management of policy programs and infrastructure, and local intervention. Table 3 and Table 4 summarize the major differences and common aspects between the U.S, Canada's, Portuguese, Spanish and Brazilian policies.

Table 3: Cross-national comparison of governance, decentralization, and local intervention

Type of support			U.S.A.	CANADA	PORTUGAL	SPAIN	BRAZIL
Air Service	Program for support of air service development for small remote communities		**Centralized** (EAS and SCASD are managed by the U.S. Department of Transportation – U.S. DOT)	-	**Centralized** (PSO)	**Centralized** (PSO)	-
	Financial support of air carriers		**Centralized** (EAS and SCASD are managed by the U.S. Department of Transportation – U.S. DOT)	**Centralized** (Indian and Northern Affairs Canada - INAC). **Some degree of decentralization** at the regional and provincial level.	**Centralized** (Central Government) in both the PSO and non-PSO cases.	**Decentralized**	-
	Traveler support	Resident discounted airfare scheme	-	**Decentralized** (Inuit and First Nations Organizations)	**Centralized** (Central Government)	**Centralized** (Central Government)	-
		Other (Health Care)	-	**Centrally** managed by the national Health care system. **Some degree of decentralization** at provincial level.	**Centrally** managed by the national Health care system. **Some degree of decentralization** for the autonomous regions.	**Centrally** managed by the national Health care system.	**Centrally** managed by the national Health care system.

The financial support of carriers is centralized in all the countries that include it in their programs, with the exception of Spain. The Spanish policy is decentralized in that several autonomous regions choose to offer compensations to carriers for development of non-PSO routes and there is no central control over these decisions. Some degree of centralization takes place also in Canada; however, in this case, the central government, through the INAC, coordinates the regional decisions, in a more efficient approach compared to the Spanish.

The financial support of travelers through the resident discounted airfare scheme is centralized in the case of two of the three countries that provide it – Portugal and Spain. Canada, on the other hand, has a decentralized mechanism. Regarding traveler support given to passengers with specific medical needs, we found no significant differences between the approaches of countries providing it. There was insufficient data to compare management approaches and to conclude about their efficiency gains; however, it is expectable that the centralized approaches are more transparent and therefore more efficient.

Table 4: Cross-national comparison of governance, decentralization, and local intervention (continued)

Type of support		**U.S.A.**	**CANADA**	**PORTUGAL**	**SPAIN**	**BRAZIL**
Infrastructure	Program for support of small airport infrastructure	**Centralized** (AIP is managed by U.S. Federal Aviation Administration - FAA)	**Centralized** (ACAP is managed by Transport Canada)	-	-	**Decentralized** (regional authorities "Comandos Aéreos Regionais" – COMARs)
	Management, operations, maintenance and capital investments	**Centralized** capital investment (AIP is managed by U.S. Federal Aviation Administration - FAA). **Decentralized** management and operations and maintenance.	**Centralized** capital investment (ACAP is managed by Transport Canada). **Rather decentralized** management and other support (provincial and municipalities' levels).	**Centralized** for ANA and ANAM airports (managed by ANA). **Some degree of decentralization** for others.	**Centrally** managed by AENA	**Centralized** by INFRAERO for INFRAERO airports (**some degree of decentralization** through INFRAERO regional divisions). **Decentralized** (COMARs) for airports managed by municipalities and states.
Local Intervention	Public	**Yes**. Local authorities participate on the selection of the EAS carrier.	**Yes**	**Yes**. Regional governments and local authorities participate on the imposition of PSOs.	**Yes**. Autonomous governments participate on the imposition of PSOs and choose whether to pay subsidies to carriers on other routes.	No
	Private	No	**Yes** (in a few cases)	No	No	**Yes** (in a few cases)

Capital investment in small infrastructure is centralized in the U.S., Canada, and Spain and in

the case of Portuguese ANA and ANAM's airports and Brazilian INFAERO's facilities. Investment is decentralized for a few Portuguese regional airports, and for many Brazilian small airports that are either managed by their municipalities of by their states.

Centralized and decentralized approaches have achieved mixed results. Local community management of airports presents good results when communities have a tradition of effective management or strong interest in the infrastructure (as in the U.S. and the Portuguese cases). On the other hand, in cases where local communities lack such a tradition and/or funding and/or do not recognize the infrastructure as important for the community (as in the case of most Brazilian airports managed by municipalities), the decentralized approach fails. In the Canadian case, where the two forms of governance are present, we found no evidence that one approach is performing better than the other.

Local public participation is present in four countries - the U.S., Canada, Portugal, and Spain, and appears have positive impacts on air service development as shown in communities' case-studies. There are no major differences between local private interventions among the five nations. In Canada and Brazil, there are a few cases of Public Private Partnerships for air service development, but those are the exception and not the rule.

4.3. Communities

Another significant difference between the U.S., Canada, Portugal, Spain, and Brazil lies in their communities' contexts. Table 5 summarizes the major differences and common aspects between the U.S, Canada's, Portuguese, Spanish and Brazilian communities.

The extent of the problem of demand level is different for each country: in the U.S. and in Spain there are several communities with sufficient population size to guarantee passenger demand, while in Portugal there appears to be only one (the Island of Madeira). In Brazil, from the population size viewpoint, there would be several communities with no major problems; however, their low income levels lower demand for air services.

In terms of isolation level, the extent of the access issue is also different for each country and cross-country. Only in the U.S. and in Spain, non-isolated communities were identified.

The strong association between tourism and air service development for some communities

also carries important policy implications. It provides powerful corroboration for promotion of tourism growth as a key mechanism for improving air accessibility cost results.

Table 5: Cross-national comparison of communities' contexts

Community	U.S.	CANADA	PORTUGAL	SPAIN	BRAZIL
Population size	Medium, small and very small in Alaska	Very Small	Medium to very small	Medium to very small	Medium to very small
Isolation	Remote (Alaska) to not isolated	Remote to moderately remote	Remote to moderately remote	Remote (Canary Islands) to not isolated (mainland)	Remote to moderately remote
Average income levels	Medium	Medium	Medium	Medium	Low
Tourism	Relevant for a few communities in Alaska and a few other non-Alaskan communities	Relevant for a few communities	Relevant for the insular locations	Relevant for the insular locations and exclaves	Relevant for a few communities

4.4. Market regulation

Another significant difference between the U.S., Canada, Portugal, Spain, and Brazil is found in the level of intervention of governments on the small remote communities' markets. Table 6 summarizes the major differences and common aspects between the U.S, Canada's, Portuguese, Spanish and Brazilian policies.

Portugal is by far the most interventionist nation. Central and regional governments dictate impositions that range from minimum service frequencies, schedule, and cargo services, to the system airlines use for selling flight tickets. On the opposite side of the spectrum lies Brazil that does not currently impose any restrictions on its regional aviation market.

Table 6: Cross-national comparison of policy market regulations

Regulation	U.S.A.	CANADA	PORTUGAL	SPAIN	BRAZIL
Frequency	No.	No	**Yes** (PSO). Minimum services.	**Yes** (PSO)	No
Schedule	No	No	**Yes** (PSO). Convenience, work schedules, and to allow for connections with other flights.	**Yes** (PSO)	No
Airfare	No	No	**Yes** (PSO). Price cap for residents and students and regulation of fare structure – available seats at a discount fare.	**Yes** (PSO). Price cap for all travelers.	No
Operating period	No	No	**Yes** (PSO)	**Yes** (PSO)	No
Punctuality	No	No	**Yes** (PSO)	No	No
Marketing and airfare purchase	No	No	**Yes** (PSO)	No	No
Capacity	**Yes**	No	**Yes** (PSO)	**Yes** (PSO)	No
Load factor	No	No	**Yes** (PSO)	**Yes** (PSO)	No
Aircraft	**Yes**	No	**Yes** (PSO)	**Yes** (PSO)	No
Cargo	Only for Alaska	**Yes** and Mail Service	**Yes** and Mail Service (PSO)	**Yes** (PSO)	No
Cargo fare	No	**Yes**	**Yes** (PSO)	**Yes** (PSO)	No

4.5. Industry structure and age of deregulation

Another significant difference between the U.S., Canada, Portugal, Spain, and Brazil is observed in their deregulatory stages and industry structures. Table 7 summarizes the major differences and common aspects between the U.S, Canada's, Portuguese, Spanish and Brazilian policies.

The U.S. case represents the oldest deregulation and the most mature regional aviation market of the sample. Canada, Portugal and Spain reforms are more recent and have approximately the same age. While the Canadian market is mature, on the Portuguese and the Spanish markets there still exists some growth and innovation. The Brazilian market is the youngest, which is consistent with the economic developing stage of Brazil and its very recent

regulatory reforms.

Table 7: Cross-national comparison of industry structure and age of deregulation

	U.S.A.	CANADA	PORTUGAL	SPAIN	BRAZIL
Market and Age of deregulation	Mature (>30 years)	Mature (From the mid-1990s)	Not yet mature (From the mid-1990s)	Not yet mature (From the mid-1990s)	Young market. Under regulatory reform. Recent re-regulation
Competition	Moderate to low or non-existent	Moderate to low or non-existent	Low or non- existent	Moderate to low or non-existent	Moderate to low or non-existent
Carrier business model	Private regionals and LCC	Fully owned or joint-venture with Inuit or First Nations organization, private regionals and LCC.	Publicly owned flag and regional. Private regional and LCC.	Private regionals and LCC	Private regionals and LCC
Traffic feeder	Generally feeds majors	Generally does not feed majors	Generally does not feed majors	Yes for regionals	Yes for regionals, no for LCC
Technology and Aircraft capacity	Turboprops and regional jets /Small capacity	Turboprops and regional jets /Small capacity	Turboprops and mainline and regional jets /Small to medium capacity	Turboprops and mainline and regional jets /Small to medium capacity	Turboprops and mainline and regional jets /Small to medium capacity

Some competition is present all countries – the U.S., Canada, Portugal, Spain, and Brazil; however, there are important differences between competition levels within each country. Thinner markets appear to be natural monopolies in every country of the sample – they present little or no competition at all – both in tendering processes and in operations. This situation represents a high risk of loss of service with potential very negative impacts in the most remote communities.

6. CONCLUSIONS

A central conclusion of this paper is that effective policy design and implementation requires attending to both infrastructure requirements and air service. We find that policy programs should include assistance to small airports to fund both capital investments and expenses for maintenance and operations. Centralized support is recommended where local communities lack the resources. The damaging effects on efficiency of cross-subsidies under monopolistic infrastructure management are also clear.

Policy performance appears to improve with the promotion of competition between carriers, and the implementation of tendering processes seems to help. Our results suggest that supporting established major carriers creates inefficiency and that the rigor and structure of market regulation have particular impact on competition. Moreover, the creation of competitive markets is important not only for the removal of bureaucratic barriers, but also for transparency of subsidies. Independence of the regulatory authorities is also required. Essentially, our findings suggest that targeting communities that are de facto isolated and have specific travel needs (medical, education, etc.) results in efficiency gains and is an effective way of achieving equity and social assistance. Subsidies to all passengers, on the other hand, prove to be a wasteful use of resources. An assessment of the distribution of benefits is recommended to evaluate the effectiveness and need.

The significance of political and local authorities' interest to program results argues for the drive for political and local contribution. Private participation, on the other hand, seems to have a limited impact on policy performance, based on our analysis. Significant efficiency gains seem to be achievable by implementing annual and long-term performance benchmarking procedures and performance measures. Likewise, independent assessment of policy results should be conducted to support its choices.

ACKNOWLEDGEMENTS

The financial support from the Fundação para a Ciência e a Tecnologia (FCT) through the Ph.D. scholarship SFRH/BD/35149/2007 (MIT Portugal Program) is gratefully acknowledged.

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