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Diversification after resource crises; the case of tourism in the French archipelago of Saint-Pierre and Miquelon

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We use historical economic data of the Islands of St Pierre and Miquelon (SPM), a territory of France situated 25 km south of Newfoundland (Canada), to explore different narratives of modern growth theory applied to small island economies when major changes in resource endowment occurs. The economy of SPM was less diversified than other territories because of privileged historical access to fisheries resources that underpinned the main sectors of the economy. That access was rapidly reduced because of changes brought about by the extension of the EEZ by Canada, and other fisheries management changes over time. The collapse of the northern cod stocks led to the cod fishing moratorium, imposed by Canada in 1992. This last major change, a crisis for SPM, provides the backdrop to explore the responses by the government of France and the population of SPM in the wake of the moratorium. Public investments were made in tourism to reorient SPM towards a more diversified economy. However, available data show an unresponsive tourist sector despite substantial amounts of public investment in infrastructure aimed at, among other things, improving tourism. These observations lend weight to various narratives of the eviction associated with public spending aimed for a long time at the fisheries sector, which made diversification difficult. The only sector that seems to show evidence of diversification is the artisanal fishery. However, there is little evidence that this diversification was generalized to tourism despite important public investment.

Small island economies have been studied in the economic literature, exploring issues of economic diversification, the impacts of trade, or the over-exploitation of natural resource endowments (Bertram & Watters 1985; Poirine 1994; Bertram 2006; Brander & Taylor 1998; Bunce *et al.* 2009; Briguglio 1995; Cashin & Loayza 1995). However, other macroeconomic issues of how these smaller economies adapt to rapidly changing and at times cataclysmic changes in climate, resource endowment, access to resources, and large changes in population due to migration are less numerous. When these changes happen, an oft-tried first step is to prop up aggregate de-

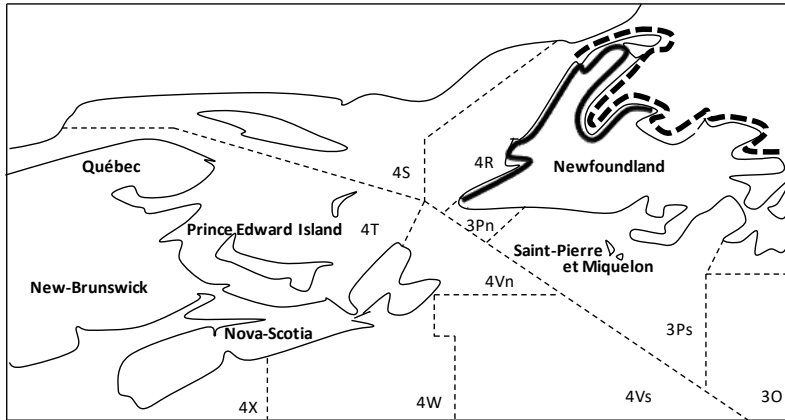
mand by government spending, and then to spend on infrastructure that supports diversification. But ultimately, macroeconomic and structural adjustment policies dealing with these changes run up against the issue of how groups of people behave in the face of change, and how the size of a population might affect growth dynamics. This behaviour is not always straightforward. For example, new narratives in growth theory argue that the motor for most growth in any economy is the presence of a critical mass of profit-minded entrepreneurs, capable of changing rapidly to conditions in the economy, thus assuring a stock of innovations that will continue

to endogenously add to the growth of the economy (Michelacci & Silva 2007). For small island economies, achieving such a critical mass may be challenging (Baldacchino 2015a). There is also a well-established economic literature that explains the impacts of more interventionist policies, especially the impacts of these policies on the employment and innovation dynamics in the economy (Faggio & Overman 2014; Burdett 2012; Gay 2012). Still other narratives from growth accounting and Real Cycle Theory argue that policy impacts or exogenous impacts such as resource endowments will have complex effects on labour and financial markets, which will ultimately affect the rate of economic growth.

The effects of rapidly changing natural resource endowments was acutely felt in the Islands of St. Pierre Miquelon (SPM) a territory of France, in the wake of the collapse of the cod fishery in Eastern Canada. The judgement by the International Tribunal for the Law of the Sea in New York in 1992 further reduced the access of SPM from a much larger fishery based upon their historical relation with Canada to what is now called the “baguette”. These events provide us with a case study and analysis of an under-represented island economy, where the scale of the economy and the type of public interventions may have imposed limits to growth and diversification. Studying these cases is important, because many island nations confront similar types of problems mainly related to scale, and so policies aimed at favouring growth need to take scale and the complexities of human behaviour more into account.

This case study covers first the history and jurisdictional aspects of SPM, focusing on the conditions prior to their resource crisis, and what happened after the decision of 1992 and the Moratorium imposed by Canada. The following section discusses different modern narratives of public sector spending and likely impacts on economic diversification and growth. This is followed by an empirical analysis aimed at understanding the impacts engendered by the reduction in access to fishing, and the attempts by France

Figure 1. Proximity map and approximate access that SPM to fishing grounds (NAFO fishing areas, as 3Ps) prior to the 1992 judgement. The treaty shore of 1713-1783 is delineated by the dashed bold line, and the Treaty shore of 1783-1904 is delineated by the continuous bold line.



and SPM to mitigate the impacts. The paper concludes with a discussion of alternative policy options for encouraging tourism in very small economies.

History and jurisdictional aspects of SPM

SPM has never been, at least in modern times, economically independent from France. Even before the judgement of 1992 and the moratorium that was imposed shortly after, the French State was deeply involved in the maintenance of the economic activity of fishing. For example, the 1981 report of the *Institut d'émission des départements d'outremer*, the French State was involved in buying 2 vessels for longlining experiments for artisanal fishermen from the Miquelon islands, financial incentives for fleet modernization, financial incentives to fishermen to hire young workers, financial incentives to hire additional crew-members, bonuses at the end of the fishing season, bonuses for the best fisherman, per-month bonuses for landings, bonuses for the winter season, according to access to alternative employment, and several one-off subsidies related to fuel, equipment rentals, and salary replacements for bad fishing seasons. All these interventions would have fixed the population on the path of development dominated by industrial fisheries.

In 2006, the CIA World Factbook estimates the GDP of SPM at Purchasing Power Parity (PPP) at 215.3M USD, and a per capita GDP (PPP) at 34,900 USD. Annual transfers from France, mainly fisheries related, averaged about 60M USD during that period, making the proportion of government spending in the economy about 28 %.

SPM is now a self-governing overseas collectivity of France, like French Polynesia, Saint-Barthelemy and Saint-Martin in the French Indies. It is also the smallest of the overseas islands with around 6,000 inhabitants, and is the most northerly collectivity. By comparison, the population in the other French collectivities mentioned above are between 50,000 and 200,000. This specific administrative status is not the same thing as a département (or county) in France, but it confers French citizenship to residents. The relationship between Canada and SPM was thus a relationship with France, and reflected the geopolitical aims and concerns of France, rather than those of SPM. During the court case in 1992, which would eventually define the EEZ of SPM, it was France who led the negotiations in New York. Their litigators were greatly outgunned by those from Canada. Mutual fishing relations between the Federal Government of Canada and France evolved from the time when the Canadian EEZ was first declared, leading both countries to claim an in-

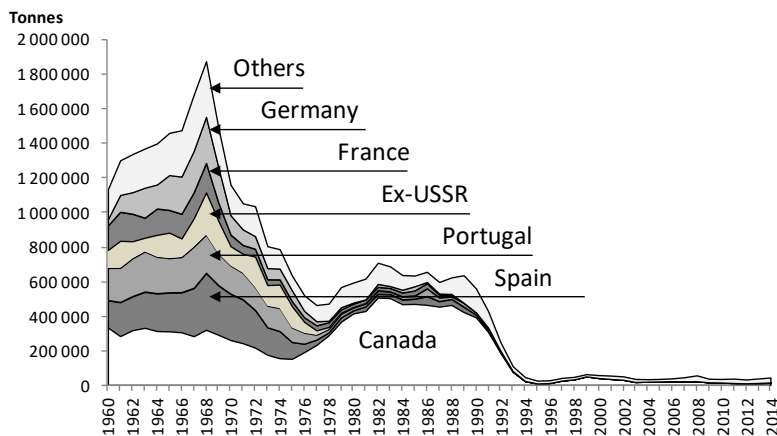
ternational arbitration for the delimitation of the maritime zones around Saint-Pierre et Miquelon. The decision of the Court of Arbitration was delivered in 1992, a few days before the two-year moratorium on ground fishing imposed by Canada.

The first agreement for fishing cod in the Northwest Atlantic dates to the Treaty of Utrecht in 1713, recognizing the French fishing rights off the coast of Newfoundland, called the French shore.

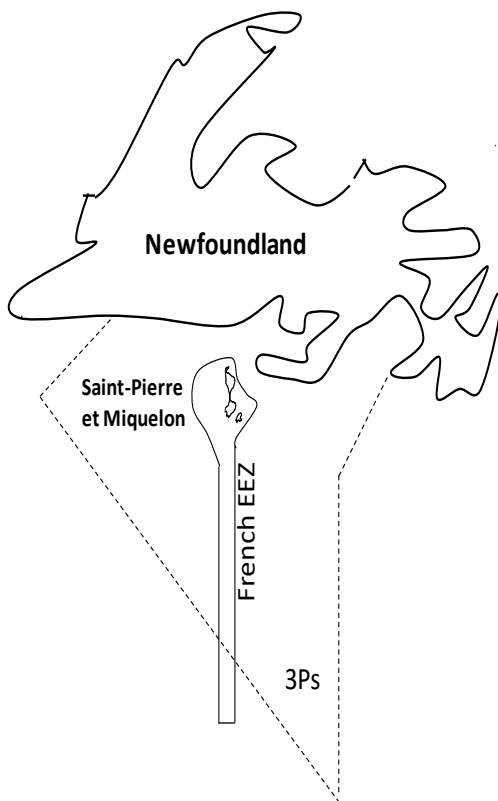
This agreement was renegotiated as the "Entente Cordiale" (friendly agreement) between the two former colonial powers in 1904. French fleets could continue fishing, but without touching the coast of Newfoundland (Fleury 2010). Canada started the negotiation of a new fishing agreement with France in 1972. The evolution of international law of the sea in the 1960s led to an expansive appropriation of maritime areas by many countries. Canada entered this process in 1964, defining a territorial sea under federal jurisdiction to 9 nautical miles from the coastline. This jurisdiction was extended to 12 nautical miles in 1970. The 1972 agreement between Canada and France was another step on the path of expanded appropriation of maritime zones. Article 3 of the 1972 Agreement between Canada and France specified the withdrawal of the French fleets by 1986, giving a period of fifteen years of commercial exploitation "on an equal footing with Canadian vessels". In Article 4 of that agreement, "a neighbourhood arrangement" for the archipelago was included, allowing a dozen vessels registered in Saint -Pierre to access to fisheries without limitation over time².

Canada unilaterally decreed the extension of its exclusive economic zone (EEZ) to 200 nautical miles on 1 January 1977, provoking the exclusion of the European fleets from the Canadian waters, excepting the nearest neighbours, SPM, Greenland and United-States (figure 2).

France in turn extended the EEZ around the archipelago on 25 February 1977. These extensions had overlaps in

Figure 2. Total landings (tonnes) of cod, 1960-2014.

Source: Northwest Atlantic Fisheries Organization - NAFO

Figure 3. The French EEZ around SPM after the decision of 1992.

Source: Plantegenest, Iosipescu & Macnab (2003)

the claims. Both governments initiated cooperation on fisheries control in 1979, but without addressing the issue of overlapping claims. Canada admitted a coastal strip of 12 nautical miles around SPM, a position opposed by France, which wanted the court to reach a decision of 200 nautical miles.

Canada and France decided to entrust the delimitation of maritime areas around the archipelago to an international arbitration tribunal on March 30, 1989. Canada defended the coastal law while France claimed historical rights. France wanted to apply the principle of equidistance, which would

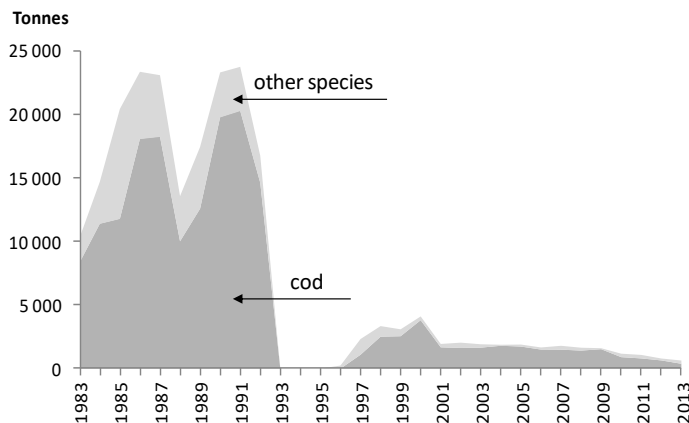
have given two thirds of the 3Ps area in Figure 1 to France.

It turns out that the Court of Arbitration in New York on June 10, 1992 largely favoured Canada, and severely limited the EEZ claims of France. The final decision gave Canada a territorial sea of 24 nautical miles to the west and south of the archipelago, maintaining the coastal strip of 12 miles to the east, in accordance with 1972 agreement, and the corridor 200 miles to the south that was 10 nautical miles wide (Charney & Alexander 1998). The New York verdict also upheld Canada's claims with respect to fisheries management policies, including the 3Ps area now in the EEZ of Canada, excepting the areas reserved for France (Figure 3).

The population of Saint-Pierre and Miquelon, led by a group of protestors, mounted a spirited opposition to the verdict, and loudly expressed fears for the future of the fishing industry. These protests made the news both in Canada and in France. But at the nation level, the record also shows that interest in the outcome was markedly different between Canada and France. One indication is that France sent far fewer legal experts to the litigation than did Canada, to the great disappointment of the SPM activists (Le Floch & Wilson 2017).

The Canadian government announced the Moratorium on cod fishing on 2 July 1992, shortly after the court decision. The ban affected fishermen in Newfoundland initially for two years and did not directly address the 3Ps fishery carried on by vessels of SPM. In effect, the decisions of then Canadian Fisheries Minister John Crosbie created nearly 20,000 unemployed persons in Newfoundland (Parsons 1993; 2010). Although the cod fishery was maintained in other areas, the Total Allowable Catch (TAC) in 1993 was three times lower than in 1992. The disappearance of industrial fishing in 1993 was the result of these decisions. Overall, landings by the fleets of SPM, which ranged between 8 000 and 20 000 MT from 1980 to 1992, was close to zero from 1993 to 1996 (Figure 4). Landings afterwards

Figure 4. Total landings (tonnes) in Saint-Pierre et Miquelon, 1980-2013.



Source: Affaires Maritimes Saint-Pierre et Miquelon

Figure 5. Ratio Exports on Imports (in millions euros), 1960-2013



Source : Le Floc'h and Wilson (2017)

were then limited to between 2,000 and 4,000 T a year, with artisanal fisheries contributing half of the landings. The industrial fleet of SPM comprised a maximum of 7 trawlers over the 1980s, managed by two companies. From 1994, cod landings were made by two industrial trawlers from SPM and Canadian vessels. The artisanal fleet numbered from 20 to 30 vessels under 15 meters until the early 2000s (Ministère de l'Outre-Mer 2012).

The collapse of the cod fishery certainly affected the fishing communities of Newfoundland, and the future of strongly fisheries-dependent regions in the northwest Atlantic became unclear (Sinclair 1996). However, the fisheries sector in SPM were in the same position with a population of on-

ly 6000 inhabitants, compared to nearly 600 000 to Newfoundland. In the case of Newfoundland (Schrank 2005), the value of total landings after the moratorium was higher than before 1992, with a shift in target species, from groundfish (mainly cod) to shellfish (lobster, shrimps and snow crab). The provincial government used unemployment insurance to maintain fishermen in the industry. Both economies experienced important shocks, but these effects were worse for SPM, possibly because the population is smaller with an economy that was less diversified. The disappearance of the cod fishing industry, including fish processing, resulted in a dramatically decreased ratio of exports to imports after the moratorium (figure 5).

Macroeconomic growth, according to more modern narratives, requires the presence of an entrepreneurial class in a competitive environment who will make changes in the direction of economies (Acs & Szerb 2006), rather than to migrate (in this case to France or to the rest of Canada). Macroeconomists often use terms like “technological innovation” or “technical change” to explain how economies grow, and it is generally recognized now that growth due to innovation is an important element for growth in an economy (Romer 1990). Entrepreneurs, according to Kirzner (1980), are alert to new possibilities of linking the production of a good or service to satisfy emerging or expressed needs. Such alertness implies possibly changing the way one goes about producing something, and with an eye towards satisfying a felt demand. This behaviour is in large part why economies diversify. Yet modern growth theorists also talk about network externalities: the lowering of innovation costs through a concentration of human and knowledge capital. But this requires a critical mass of entrepreneurs. “Technological Innovation” can be very low-tech; moving for example from simply fishing and delivering a catch at a processing plant to offering, say, services that are connected to the act of fishing, such as recreational activities and restaurant services³. This notion of entrepreneurship implies an economy that is pre-disposed to diversification, allowing human resources to flow more freely into sectors of promise.

Before a crisis strikes, public powers tend to spend in areas that will exploit a perceived comparative advantage, but which may lead to path dependence and suppressed entrepreneurial capacity in other areas. When a crisis strikes, spending may be done to maintain aggregate demand during the crisis: an essentially Keynesian response to recessions. This tendency is especially the case for France, which may look upon their collectivities as strategic holdings that might yield other benefits over the longer term⁴. It may make more sense to invest in the infrastructure of SPM and

to keep a core population there, than to encourage migration (Bertram & Watters 1985; Poirine 1994; Bertram 2006). However, there may be a price to pay for such intervention, in that public investment may lead to crowding out of private investment and innovation. Public investment may therefore encourage path dependence and slower diversification. This makes it harder for a small economy like SPM to innovate from within. Explaining the reasons why this is the case requires some discussion of the modern theories of economic growth.

Public sector spending and effects on growth

Although the economic literature has explored the underpinnings of growth in detail over the last 30 or so years, the impacts of macro-economic policies in very small open economies like islands, especially when faced with various economic and natural disasters, has been less explored. Early work on the impacts of large changes in resource endowments (Rybczynski 1955) has shown that with a large increase in resource endowments *ceteris paribus*, increasing wage rates in the sector, which is more intensive in the use of that factor, will cause other sectors to contract in the economy. This is the phenomenon known as the Dutch Disease. The reverse effect can also be shown; contracting resource endowments can cause other sectors to grow. But these results implicitly assume large diversified economies. What if an economy, by nature or by design, has few sectors to absorb the flows of labour and capital? Or more importantly, what if capital and the various forms of labour simply do not flow as the neoclassical models propose? The more generalized explorations of disasters and larger diversified countries, and human capital determinants of growth have been major research areas for Barro (1989; 2001). The neoclassical theory of growth as expounded by Samuelson and Solow focused upon the role of the labour market in helping to determine the capacity of the economy, with contributions by capital accumulation and uncertain impacts of innovation on the

country production function. The later literature on macroeconomics and the “new growth theory” Romer (1986) has emphasized the importance not just of population growth and capital accumulation, but also the importance of the accumulation of human capital and knowledge capital necessary for the emergence of an entrepreneurial class capable of generating innovations leading to continuous endogenous growth in an economy. The new growth theory focuses upon the creation of “knowledge capital”; that accessible body of data and analyses that enable entrepreneurs to innovate. There is also the more recent concept of “social capital” used in the entrepreneurship literature, (Acs & Szerb 2006; Audretsch & Keilbach 2004), which originally came from sociology, as well as the economic work by Coleman (1988). In fisheries, two references to social capital are Gutierrez, Hilborn, & Defeo (2011) and Holland *et al.* (2013). This concept has been used to explain economic development for small island territories (Baldacchino 2005). While it is generally recognized that having “a critical mass” of these different forms of capital is necessary for sustained growth, few studies have dealt with the scale effects of capital accumulation; how small can critical masses of different forms of capital be and still be self-sustaining? The SPM case study is instructive, because the economy is relatively small, and therefore is likely subject to scale effects that could have an impact on innovation and growth.

There is also a literature that outlines both the positive and the negative effects of more direct intervention in economies by government, starting with work by Modigliani & Miller (1958) and Feldstein (1974). These and later studies argue that aggressive public investment, especially in sectors which have a high degree of substitutability between private and public investment, has a tendency to crowd out private investment, leading to lower levels of innovation, increased susceptibility to competitive effects through trade, a decline in labour force skills, a long-term loss in private

sector jobs, and a long term increase in labour inactivity and unemployment indexes. Some of this literature is contradictory. Public sector investments, which are aimed more at public services, may be optimal for long-term growth. These are often less substitutable with private investment, and may explain cross-country differences in long term growth (Chen 2005), for example, in Southeast Asia. Investments aimed more at supporting aggregate demand might conceivably be introduced at times when a population is in danger of losing human capital through long term inactivity, and may be necessary for economies that are less able to rely on the more natural innovation response, but long-term growth may be slower as a result. The economic literature on the role of public spending and the possible effects on economic growth is large, and ranges from describing the role of deficit spending on eviction effects in markets for investment funds leading to high real interest rates and subsequent underinvestment by the private sector, to arguments explaining why these eviction effects on the investment markets are overstated (Barro 1989; 1990).

There are a number of studies on the impacts of state enterprises on sector productivity, which in turn might affect the rapidity of growth, and the impact of spending on the labour market and the productivity of labour over the long term. Public sector spending as the replacement or as a complement to private sector investment has been well explored for larger diversified economies. However, when economies are smaller and less diversified, with smaller populations, the number of key studies are reduced, and the main observations that have been made for larger economies⁵ may not apply to smaller economies such as SPM. An example of this is found in Henry & Miller (2009), who argue that divergences between the growth trajectories of Jamaica and the Barbados after independence may as well have been to do with differences in macroeconomic policies each island developed in response to external shocks to the island economies since

independence. The qualities of the institutions in these economies, though they may be based upon the institutions that were put in place during colonization (Acemoglu, Johnson, & Robinson 2001), may not fully explain divergent growth trajectories.

Another literature on small island economies raises the question of convergence with their metropolitan patron, considering three categories of small territories, sovereign independent microstates, free-association or associated territories, and politically-integrated territories (Bertram 2004; Armstrong & Read 2000; 2002). Results based on a worldwide sample of 63 small island economics, including SPM, show a strong economic convergence of territories with their patrons, mainly those that are politically integrated as SPM is with France.

The macro-economic policy successes and failures of governments may be even more pronounced the less diversified the economy is. When economies are based upon a limited number of exhaustible resources, more aggressive macroeconomic policy to respond to shocks may need to be done to mitigate the negative effects on human productivity, and the lagged effects that these may have over the long term. Employment statistics are now understood to be tied to the psychology that drives human behaviour during periods of inactivity. This is in turn tied to the lagged evolution of activity rates that have a cascade effect on unemployment figures: first rising as workers regain confidence to search for work again, and then declining as the economy absorbs labour. We have not seen comparative evidence of how responsive small economies are to more diversified economies, but a reasonable guess is that in economies with more ties to extra-market subsistence activities, when labour exits the market, if it does not emigrate, it gets applied at home.

A longer-term effect of a disaster of this type is that it can impact not just willingness to find work (a decision to search for work or work at

home) but can force members of a population to withdraw from the job search to re-group and reinvest in human capital. These effects are thought by some growth accountants and real cycle theorists to slow re-entry of both human capital and private investment into the economy, slowing at the same time innovation and entrepreneurship. While population growth and capital accumulation are important variables of economic growth, innovation and the search to keep a consistent level of innovation going in an economy is a key element to sustained endogenous growth.

To see these narratives in a simple model of growth, consider the neoclassical model of growth proposed by Solow (1956). This theoretical platform provides us with opportunities to explore the various growth hypotheses and possibly compares these to dynamic analyses we conduct on SPM data. One hypothesis that should be explored is the one of government investment and its long term effects on key macro-economic indicators. But before we do this, we tell the story of SPM using the neoclassical model (Figure 6). For all of these narratives we assume that the potential real GDP can be expressed as a production function (FP):

$FP = f(H, NC, PC, HC)$ where

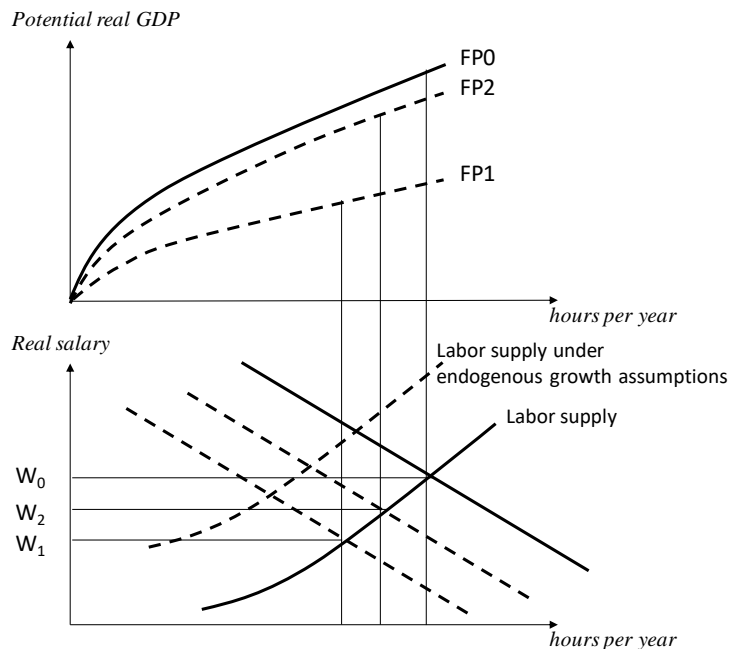
- H Hours of work supplied by a population;
- NC Natural capital endowments, like access to fish stocks;
- PC Physical capital stock, including gross investment and public spending on capital or infrastructure projects;
- HC Human Capital/knowledge capital/social capital

There are some important interactions and derivative variables used in modern growth accounting related to this that are not shown here. Innovations, which in the neoclassical framework are exogenous and uncertain, are shown here in order to discuss lags due to labour supply shifts.

The collapse of the cod stocks in 1992 was a trigger for Canada and SPM to change the course of their respec-

tive economies. Canada, the more diversified economy, could afford to be less efficient in its response, and by most accounts it was. Work by Hamilton & Butler (2001) on the social changes in the outports of Newfoundland suggest a continual process of change starting in the 1980's, with these changes slowed by intervention by the Canadian government in labour markets after 1992. When we think of the SPM economy in the neoclassical growth theory framework, it and the French government did not have as much margin for error because of the relative lack of diversity of the SPM economy. FPo is the relation between hours of available work and the potential GDP of an economy. The form of FPo is a function of natural resource endowments, or Natural Capital (NC), Physical Capital (PC), the population, and Human/Knowledge/Social Capital leading to technological innovations, which are uncertain events in the neoclassical model. After the moratorium and the negotiation of the EEZ of SPM, resource endowments declined, pulling the potential GDP trajectory to FP1. This reduced the marginal value product of labour, depressing the real wage rate (MVPo to MVP1 and w_0 to w_1). These lost resource endowments were gradually replaced by public sector spending, mostly in infrastructure⁶; the stock of capital in SPM increased over time since the disaster (FP1 to FP2). This increase in the stock of capital could have been expected to raise the productivity of labour, and real wages (w_1 to w_2). However, capital investments may not be able to raise the level of potential GDP to the level it was before. Further investments in physical capital and job creation that does not build human capital can then crowd out private investment needed to fuel the innovative process. The economy of SPM, while having the outer appearance of having survived the crisis, was saved at great cost by France, and could continue to experience limited growth and diversification because of the secondary effects of these public investment decisions.

Figure 6. A neoclassical growth model related to the labor market.



An alternative hypothesis we can explore might be called the new growth theory/growth accounting/real cycles hypothesis. When a small economy suffers a crisis such as the loss of resource endowments, many people lose the jobs that they normally have. Even if the government intervenes with works projects, it takes time for displaced labourers to find a new job and learn the new skills necessary to regain former productivity. While this may not be a long time for semi-skilled jobs, it takes time nonetheless. Even if the presence of jobs could allow a shift of labour supply (the black supply curve in the figure), displaced workers in a very small economy still have to readjust the balance between subsistence, home/informal work, and the work they try to offer on the formal market. This alternative hypothesis suggests that we can expect a longer lag between public investment and labour activity figures, since part of the displaced labour force may even voluntarily stop searching for work in the formal labour market, preferring to work at subsistence activities, jobs at home, and even resorting to the informal market⁷.

In small island economies, this tendency is probably non-negligible (Cashin & Loayza 1995; Tisdell & Fair-

bairn 1984). So, the labour force inactivity may rise in the first parts of a recovery. In most modern narratives of growth, entrepreneurship and innovation is endogenously derived, and is an important part (some would say the most important part) of economic growth. It is these tertiary effects of innovation that eventually push FP beyond FP₀ and augment productivity of labour rapidly, increasing real wages in the process, and obviating the need for public spending. This however requires an entrepreneurial class that is willing to try different alternatives. Some years on, there does appear to be an emerging entrepreneurial class, mainly among the young engaged in activities other than industrial fishing. An interesting research agenda for the government of France would be to explore the economic history of that emergence, and to compare recovery lags in larger economies after depressions with recovery lags in smaller island economies.

It is difficult to test these macroeconomic phenomena for territories such as SPM, in part because the national statistics of France (INSEE reports) are summarized with data from other territories. For these reasons, we used the information found in the annual reports of the *Institut*

*d'émission des départements d'outre-mer*⁸(IEDOM) for years 1981-2013. These reports are variable in terms of the data presented, and are made on an annual basis.

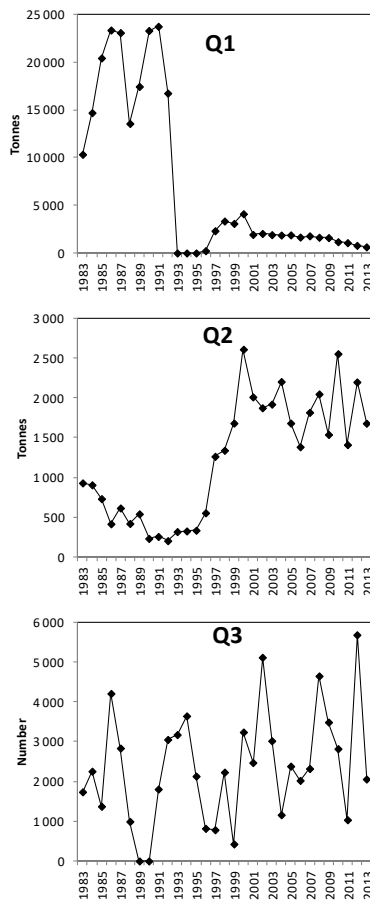
Empirical results

We test empirically three variables explaining the sources of economic growth in SPM, industrial fishing (Q₁), artisanal fishing (Q₂) and tourism (Q₃). Descriptive statistics are presented, with yearly evolution of the three industries and correlation between variables.

Because we do not have the equivalent of data on gross domestic product using standard methods of national accounting for all years, we have focused upon other indicators of economic performance based on three proxies for outputs. Q₁ represents the production of industrial fishing, Q₂ measures the production of artisanal fisheries, and Q₃ is the number of cruise ships (Figure 7). The production of industrial fisheries (Q₁) rose from 10,000 to nearly 25,000 tonnes before the announcement of the moratorium and the decision of the New York Court on the delimitation of waters between France and Canada. During the last fishing season in 1992, production remained high at 16 745 tonnes. From 1993 to 1995, no production was reported. Artisanal fisheries (Q₂) developed at the end of the 1990s but were insufficient to compensate for the small contribution of industrial fishing. The number of cruise passengers (Q₃) is estimated to be cyclical, with high thresholds between 5000 and 6000 visitors in 2002 and 2012.

The evolution of production from industrial fisheries shows an asymmetrical profile with a strong spread to the right such that the average is much higher than the median (Table 1). The value of skewness is the strongest (1.04). On the contrary, the production of artisanal fisheries follows a reversal, spreading to the left and with more flattening (Kurtosis - 1.32) compared to the other two sectors. The cruise tourism industry (Q₃) displays an intermediate profile on the

Figure 7. Yearly evolution of the three industries



time series spread (Skewness 0.43) but less dispersion (Kurtosis -0.01).

The evolution of the industrial fishing sector is negatively correlated with that of the other two sectors. This correlation is much stronger and above all statistically significant between the two fisheries sectors (-59.6% with a very strong empirical reliability threshold, which exceeds 99%). The two sectors of reconversion, artisanal fishing (Q2) and cruise tourism (Q3), evolve positively (positive correlation of 31.69% which statistically significant at the 90% confidence level).

We used a multi-output model to look at some variables that could explain the evolution of artisanal fishery and tourist activity over time after the resource crisis and the Moratorium in 1992. Four explanatory variables are used to explain each output variable: see Table 3. One is time (T), which

could be a proxy for a gradual development of a marketing activity, which would attract increasingly larger numbers of tourists, and an increasing trend for artisanal landings from small-scale fisheries. Dummy variables are included to capture the effect of the moratorium that took effect in 1993 ($POST93$). A third element is composed with the public expenditures in salary for civil servants (PU). Another variable is exchange rate of CAD and euro (RA). We would expect that variations in exchange rates would explain variations in numbers of visitors.

The model allows us to study the stochastic properties of the time series ($Q1$, $Q2$ and $Q3$). The historical events that occurred over the study period were the cessation of industrial fishing production, the effects of fiscal policy on the wage bill of civil servants, and changes in the exchange rate. These may have altered the structure of each time series. If the structure has changed over time, then the underlying process is no longer stationary and probably involves the presence of a unit root. In the case of a stationary process without unit root, the structure is constant in the face of historical events.

The results in Table 2 show the disappearance of industrial fishing ($\ln Q1$) and a resumption of the economic activity carried out by artisanal fishing ($\ln Q2$) and cruise tourism ($\ln Q3$) since 1993. The trend (T) is negative and significant only for the sector $Q1$ at the 5% level of the Student test. The increase in production by artisanal fisheries and cruise tourism appears from 1993 onwards. The $POST93$ parameter is positive and significant only for sectors $Q2$ and $Q3$ ($\ln(Q2)$ and $\ln(Q3)$).

The two other explanatory variables are public expenditure as measured by the civil service payroll (PU) and the CAD / Euro (RA) exchange rate. The estimates show a positive effect in terms of support for the two sectors of industrial ($Q1$) and artisanal ($Q2$) fishing, especially public expenditure. There is no significant effect of this public expenditure (PU) and the

exchange rate (RA) on the cruise tourism sector ($Q3$).

We also verified the exogeneity condition of the two explanatory factors, PU and RA , according to the Durbin-Wu-Hausman test in the three equations. A low positive correlation of 37.80% between these two explanatory variables is observed suggesting no problem with multicollinearity in the estimates (the value of the VIF, variance inflation factor, does not exceed 5).

The model is globally reliable according to the Fisher (F) test. The values and signs of the parameters are consistent with economic theory.

One of our theoretical arguments was that there is a tendency to crowd out private projects when public investments are growing. Recovering a long term economic growth, after a resource's crisis for small island territories like SPM, may be slower than an economy that is more diversified.

What seems apparent from these regressions is that, despite active public investments in infrastructure and salaries of civil servants, this has apparently not translated into an increase in tourist activity. Further, other variables such as the exchange rate (CAD/Euro), which normally would be a strong explainer of the volume of tourists, is only significant for fish production ($Q1$ and $Q2$) but not significant for tourist estimates ($Q3$). There is some evidence to suggest that the moratorium ($POST93$) has had a positive effect on alternative industries ($Q2$ and $Q3$), because these estimates are significant.

However, the Dickey-Fuller and Phillips-Perron tests show the presence of a unit root on the two time series of industrial ($Q1$) and artisanal ($Q2$) fishing as the p-value for both tests are higher than the significance level at 5% (respectively 44% and 33.9% for $Q1$, 17.6% and 17.5 for $Q2$). Only the temporal data series on cruise tourism does not have a unit root, indicating stationarity (p-values are 3% from the Dickey-Fuller test and 4% for the Phillips-Perron). The structure of this industry does not depend, like the fish-

Table 1. Descriptive statistics (Sd, standard deviation)

Variable	Observations	Mean	Median	Skewness (Sd)	Kurtosis(Sd)
Q1	31	7093.18 (8583.99)	1942.00	1.04 (0.42)	-0.61 (0.82)
Q2	31	1226.96 (760.53)	1341.00	0,15 (0,42)	-1,32 (0,82)
Q3	31	2354.96 (1412.33)	2257.00	0,43 (0,42)	-0,01 (0,82)

Table 2. Results

	ln(Q1)	ln(Q2)	ln(Q3)
C	-195.95 (0.085*)	N.S	6.291 (0.000)
TREND (T)	-0.477 (0.06)	N.S	N.S
POST93	N.S	1.133 (0.000)	1.381 (0.065)
Ln(PU)	14.83 (0.07)	1 (0.026)	N.S
Ln(RA)	12.51 (0.003)	3.29 (0.000)	N.S
DW	1.122	0.934	1.173
R ²	31.9%	78.7%	11.20%
F	4.223 (0.014)	33.34 (0.000)	3.67 (0.065)
Dickey-Fuller (p-value with Const. & Trend)	44%	17.6%	0.03%
Phillips-Perron (p-value with Const. & Trend)	33.9%	17.5%	0.04%
Ho :Unit-Root	Yes	Yes	No

* Threshold of empirical significance of student t.

Table 3. Model

$$\begin{cases} \ln(Q1) = \beta_{10} + \beta_{11}T + \beta_{12}POST93 + \beta_{13} \ln(PU) + \beta_{14} \ln(RA) + \varepsilon_1 \\ \ln(Q2) = \beta_{20} + \beta_{21}T + \beta_{22}POST93 + \beta_{23} \ln(PU) + \beta_{24} \ln(RA) + \varepsilon_2 \\ \ln(Q3) = \beta_{30} + \beta_{31}T + \beta_{32}POST93 + \beta_{33} \ln(PU) + \beta_{34} \ln(RA) + \varepsilon_3 \end{cases}$$

ing industry, on historical events. However, although stationary, cruise arrivals (Q3) appear at best to be random. Further, the Durbin-Watson test confirms the absence of serial independence with positive auto correlation. The regressions using time series can be non stationary, as illustrated with the fishing industry (Q1 and Q2), indicating potential spurious regressions (Granger & Newbold 1974). In the history of SPM, the non stationary state is originated from the decisions taken in 1992, felt as a shock by the locals. However, there is no evidence if shocks have had permanent or transitory effects. Other time series model specifications are required to better identify the trajectories of the three

industries, which is not the objective in this paper.

The overall interpretation of these data is that despite substantial historical investments in infrastructure and an alleged interest in tourism and integration with the economy of the region by the French government, the data suggest that these efforts have not translated into a viable tourist industry.

While encouraging a renaissance of the artisanal fishery, France and the government of SPM has also actively promoted tourism in an effort to encourage diversification. There has been increasing interest and research on Small Island Tourism Economies

(Wilkinson 1989; Shareef, Hoti, & Mcaleer 2008; Bardolet & Sheldon 2008; Gay 2012; Baldacchino 2015b, 2006a; 2006b).

The government of SPM has placed a lot of emphasis and hope on the development of a tourist industry. This sector has been developed elsewhere as an alternative to or even as a complement to artisanal fishing. Development of the tourist sector could use a broader part of the SPM infrastructure, and could take advantage of the desire by leaders in SPM to integrate more fully in the regional economy of Canada. There has been public investment in a first-class airstrip and a deep-water port that could attract tourist vessels. Such investments have been transformative in other contexts, such as for example certain ports in Alaska, or in the Seychelles. We looked for some evidence of emergence of alternative industries, focusing mainly on artisanal fishing (Q2) and cruise tourism, as a new development path for SPM.

Why we are seeing these results? There may be competitive effects at play. In our interviews with residents of SPM, they raised the issue of limited development because of the lack of competition between carriers, despite excellent infrastructure. It is also possible that while there is investment in infrastructure, that there may be less investment in human resources, and specifically in investments in the development of small business. Finally, the web presence of SPM, and availability of information of interest to tourists, seems rudimentary compared to, for example, New Brunswick, Newfoundland or Prince Edward Island (Baldacchino 2002). Other information from sites like Trip Advisor suggests that SPM may not have enough diversity of activities in different price ranges to attract tourists.

Discussion

One of the objectives of this case study is to use ideas from macroeconomics and growth theory to understand the possible impacts that public sector spending has on the dynamics

of diversification towards tourism after resource disasters. The case of SPM appears to be an example where the size of the population, the endowments, and the labour dynamics within the economy made it difficult to change course rapidly to tourism, even with substantial public investments aimed at favouring these changes. Encouraging economic growth and diversification in small island economies like SPM may be more complex, because one alternative to employment in such an economy is subsistence and state support. In those cases, the impacts of public investment favouring a new sector may be sluggish. If an island economy is trying to transition from fishing to a more diversified economy after years of dependence on industrial fishing, the economic response to infrastructure investment may be slow or unresponsive.

Another way of assuring more responsiveness in an economy is to invest in the presence of a critical mass of profit-minded entrepreneurs capable of adapting to conditions in the economy. However, interventionist policies aimed at assuring this would be very different from a more traditional Keynesian spending policy, which may have negative impacts on the employment and innovation dynamics of the economy. The alternative long-term policies would focus more on the development of local entrepreneurs for a more diversified economy through education, liberalized lending to small tourist-related businesses, encouraging competition among air and ferry carriers, investing in a better on-line presence aimed at tourists, and liberalizing trade with Canada and with France.

Our empirical results for SPM seem to show that the more classical public interventions may have led to a hollowing out of the labour force and with it, entrepreneurial capacity that could have flowed to tourism. As shown in the estimates, there is no significant influence from public expenditures and exchange rate on arrivals by cruise ships.

A potential explanation is because discouraged job-seekers turn to subsistence activities more readily than in more diversified economies. Second, the strong presence of the State using Keynesian-type policies instead of policies aimed at building entrepreneurial capacity may have slowed emergence of an entrepreneurial class oriented towards tourism. Finally, and in part because of these policy choices, SPM experienced accelerating out-migration and an aging population over the study period.

The rapid growth or contraction of sectors with endowment shifts is (unsurprisingly) frequently observed and are most visible in small island territories (Corden & Neary 1982; Gay 2012). The creation of public jobs in SPM also has led to high prices for commodities not available locally.

When a resource crisis strikes as it did for SPM, public powers tend to increase government spending to maintain aggregate demand during the crisis. However, more modern interpretations of growth and response to crises suggest that simply increasing capital through infrastructure projects may not achieve the desired effect, and this may be especially so for smaller populations. This is because there are different inter-related forms of capital necessary for keeping an economy functioning, and the most important forms are human capital and other forms of capital related to it (social and knowledge capital). Public sector spending may need to take place specifically in the areas that help build this capital, especially in education, re-training, small business creation and management, and practical policies aimed at, for example, making exports to Canada or to France easier for smaller businesses. Our results also suggest that more investments, both private and public, could be made that would foster greater implication of SPM in the region. This may involve encouraging more competition among carriers to the Islands, both Canadian firms and firms from SPM. In addition to this, other policies could be developed that encourage the emergence of small businesses and local industries related not only to tourism and

artisanal fisheries, but other activities as well, such as small-scale agriculture and aquaculture (Baldacchino 2015a; 2006a). Finally, strategies to attract, repatriate, and retain entrepreneurial capacity should be a high priority for an economy seeking to encourage diversity and sustained growth.

For small island economies, economic analysis may be more complex insofar as economic alternatives are few after the collapse of the endowment supporting the main industry. It is not obvious that the reduction of public expenses would sufficiently attract more private initiatives, notably by lowering interest rates. Moreover, the archipelago benefits from favourable financial and tax conditions due to its administrative status of a territorial collectivity. The revival of private investment may depend mostly on better integration of the island territory in the regional economy of Canada.

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⁷ Krugman (2009 and elsewhere) has criticized real cycle theorists as cloaking irrational responses as rational ones. He jokes that the RBC explanation of the response of people to the decline in real wages and high unemployment as a decision by a population *en masse* to take an extended vacation, for example, during the great depression from 1929-1933. But the trade-off between work at home and work in the formal market may be more nuanced, especially in economies with limited diversity. Opting out of the job market in a non-diversified economy does not necessarily imply the consumption of leisure time. It may mean using one's work time in different pursuits.

⁸ IEDOM works as a central bank for the overseas territories politically-integrated to France, under the umbrella of the Banque de France and the European Central Bank.

¹ What constitutes "best" was not defined.

² See for example <http://>

³ These services do in fact exist in many fishing ports in the U.S., Canada and Europe.

⁴ In SPM for example, much hope is placed upon the results of exploratory drilling of oil and gas in the SPM EEZ.

⁵ The most important proviso being that an excessive presence of the public sector may lead to growth slow-downs, due to lack of innovation and a driving out of better qualified investors.

⁶ Since the adjustments to SPMs EEZ and the re-negotiation of access with Canada, there was substantial infrastructure spending; a refurbishing of the airport, road construction, public works projects, and recently the development of a hospital, a new port and a thermal power station.