

# Can we really measure the impact of port governance reform?

Nick Pilcher<sup>a1</sup> Po-Hsing Tseng<sup>b</sup>

<sup>a</sup> The Business School, Edinburgh Napier University, Edinburgh, EH10 5DT, UK; E-mail:  
[N.Pilcher@napier.ac.uk](mailto:N.Pilcher@napier.ac.uk)

<sup>b</sup> Department of Transportation ~~Technology~~ and ~~Logistics Management~~, Feng Chia University, No. 100,  
Wenhwa Rd., Seatwen, Taichung, 40724, Taiwan; E-mail: phtseng@fcu.edu.tw. phone:

## Abstract

Approaches by governments to reforming the way in which ports are governed is critical to how ports operate and fulfil their roles, and much research is devoted to investigating the impact of such reform. ~~Much research aims to ascertain the impact of port governance reform.~~ Yet, although the challenges of such research are noted, little attention is devoted to questioning whether measuring such impact is actually possible. We argue consideration of this question is fundamentally important ~~tee~~ for policy makers and researchers. Specifically, if uncertainty exists regarding whether we have measured the impact of the reform, how can we research its effect or justify its introduction? Conversely, ~~through~~ a more conscious consideration of whether we can really measure the impact of port governance reform arguably means a more effective contextualisation and rationalisation of both policy and research. In this ~~paper, which is essentially a~~ polemical paper ~~informed by the literature~~, we critically consider ~~what we feel are~~ three salient areas in relation to whether we can really measure the impact of port governance reform: 'key terms and their ambiguity~~words and their understandings~~'; 'aspects of time and geography' and 'issues of methods and context'. We summarize the key issues and offer suggestions for policy makers and researchers to approach them in an aim to both help ~~We conclude with a synopsis of our main arguments for policy makers and researchers, aimed to stimulate dialogue and help strengthen the research done in an attempt to~~ measure the impact of port governance reform, and also aid future policy development.

**Keywords:** port governance; reform; impact

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<sup>1</sup> Corresponding author

## 1. Introduction

Approaches by governments to reforming the way in which ports are governed is critical to the way in which ports operate and fulfil their roles, and much research is devoted to its impact~~Port governance reform, and its impact, is much researched~~ (e.g. Cullinane and Wang, 2006a; Brooks and Pallis, 2008; Castillo-Manzano and Asencio-Flores, 2012; Roe, 2009a; 2012). Indeed, port governance was pronounced the third most frequent research topic from 1997 to 2008 by a recent port economics survey (Pallis et al., 2011) and has many specific areas of research such as describing and analysing port devolution processes (Castillo-Manzano and Asencio-Flores, 2012). ~~S~~The value of such research is undertaken to investigate key questions such as~~know~~ whether port governance reforms have failed (Brooks and Pallis, 2008, p. 414), or to better understand port efficiency gains (Cheon et al., 2010, p. 546).

Yet, port governance reform does not take place in a vacuum; rather (barring revolutions), it takes place in the context of what other governments have done. Governments often introduce reform on reflection of reforms elsewhere, or upon perceptions that their own practices are not working. For example, governments ~~introduce~~ing concession agreements as others have already done so (e.g. Greece (Pallis, 2006)), or to redress a decline in trade (e.g. cargo trade in Taiwan (Chiu and Yen, 2015)). ~~Also~~Importantly, governments ~~need~~wish to ascertain if such reforms ~~have had~~ any impact in order, and to inform future policy decisions accordingly (cf. Brooks and Pallis, 2008; Cheon et al., 2010). Undeniably, s~~Such~~ research is not without its challenges, and these challenges are often highlighted. ~~F~~For example, the challenges of ~~defin~~itions of ‘governance’ (Roe, 2009a; 2012) or of ‘gaps’ in available data (e.g. Brooks and Pallis, 2008; Vieira et al., 2014). Nevertheless, the fundamental assumption remains that it is possible to measure the impact of the reform. Indeed, if this fundamental assumption were not made~~did not exist~~, would such research be attempted or funded?

In this paper, which is essentially a polemical paper informed by the literature ~~polemical paper~~, we question this fundamental assumption to ask ‘Can we really measure the impact of port governance reform?’ Is this an important question to ask? We argue that ~~yes~~ it is, because it goes to the heart of the validity and reliability of port governance reform. Through consideration of this question, the paper intends to reveal key issues and offer suggestions~~useful considerations both~~ for policy makers and ~~for~~ researchers undertaking the extremely complex and highly challenging task of attempting to measure the impact of such reform. The remainder of our paper considers three broad and sometimes overlapping areas: ‘key terms~~words~~ and their ambiguity~~understandings~~’; ‘aspects of time and geography’ and ‘issues of methods and context’. For each of these aspects we draw together in tabular form the key issues involved and offer suggestions for how they might be approached by both policy makers and researchers in an aim to both help measure the impact of port governance reform, and aid future policy development. ~~inally, we draw together key considerations for policy makers and researchers.~~

## 2. Key terms~~Words~~ and their ambiguity~~understandings~~

In the field of port governance, many key terms ~~are highly ambiguous and~~words are understood with huge variety and range. Consequently, any interviews, surveys, or measurements may be interpreted differently by participants, researchers, and policy makers. For example, terms may be influenced by cultural perceptions and understandings (cf. Hofstede, 1994; Holliday, 1999), and this too occurs in ports (Lu et al., 2012). In the fields of

cultural studies and language, much theory stresses the close intertwining of culture with language (e.g. Hymes, 1964). Similarly, much theory underlines the importance of ‘context’ to the language used (Bakhtin, 1981; 1986), how such language cannot be removed from its particular context (Pilcher and Richards, 2016) and how it is highly individual and subjective (Voloshinov, 1929). Such individuality and variety has significant bearing on any attempt to measure the impact of port governance reform as researchers, participants, and also policy makers could be using what they believe to be the ‘same’ ‘words’ but may have very differing understandings of them.

This ~~ambiguity and variety~~ ~~variety~~ is illustrated by considering some key terms relevant to port governance reform. For example, ‘port governance’ can refer to many elements ~~different things~~: the ownership, management and also control of a port’s operations (Talley, 2009). ‘Governance’ itself could have principally three meanings (Geiger, 2009) or five different possible formats (Stoker, 1998). Notably, ~~t~~he “concept of governance itself has many meanings” (Vieira et al., 2014, p. 646) and “the sheer number of definitions that exist is itself indicative of a concept that is both uncertain and central to the policy-making debate” (Roe, 2012, p.41). Further, “governance presents difficulties in definition which changes according to context, time, space and a multitude of other factors” (ibid, p.55, cf. Voloshinov, 1929; Hymes, 1962). ~~Moreover~~ Furthermore, approaches to governance could be wide-ranging, from post-structuralist to neo-realist (Haas, 1992); from formal to informal in types; involving side-by-side governance, top-down governance or market governance (Rosenau, 2000). Governance in a port context could also relate to considerations of corporate governance such as social responsibility in any business activity (Giannakopoulou et al. 2016). Notably, common corporate governance models have been found to produce different financial performance according to the country they are introduced in (e.g. Greece and Scandinavia (Syriopoulos and Tsatsaronis, 2011))

In addition to having individual variety and ambiguity, some key terms are very close to each other in definition, or require definition by contrast with other terms. For example, “there is only a thin line between cooperation and competition” (Wang et al., 2012, p. 404). Further, ‘devolution’ can consist of many stages, involve many elements (Vieira et al., 2014), and is a much broader concept than ‘privatisation’ (Vieira et al., 2014). ‘Privatisation’ itself should also be considered distinct from ‘commercialization’, as the latter retains more control for governments (Brooks and Cullinane, 2006).

Similarly, key port governance related terms may have different the ‘boundaries’. definition of ‘port’ is complex and varied. For example, the boundaries of wWhat constitutes a ‘port’ and where a ‘port’ ends is hard to ascertain (Vieira et al., 2014), with the hinterland often included in port economics studies (Notteboom and Rodrigue, 2005; Notteboom et al., 2013), and all actors in the chain being considered key (Vanelander, 2011). Over time, the concept of ‘port’ has become increasingly complex (Vieira et al., 2014) and the role of the ‘port’ itself ~~has also been questioned~~ as being ~~no longer~~ the only or most important entity in considering the port’s logistical capabilities has been questioned (Heaver, 1995). Regarding port classifications, some literature notes three types: “the ‘conservator’, the ‘facilitator’ and the ‘entrepreneur’” each with their own basic features (Verhoeven and Vanoutrive, 2012, p. 181). Elsewhere, in the context of public-private ownership models, some research highlights four categories (e.g. Ferrari et al., 2015) although, “as is logical, a broad array of options regarding the specific form public-private partnership may take exists within these categories” (Castillo-Manzano and Asencio-Flores, 2012, p. 519). In addition ~~Furthermore~~, port devolution is highly complex, with each port usually being considered at a particular stage on a continuum, which itself should not be seen as homogenous (ibid), and may have different short-run and long-run effects and impacts. Indeed ~~Additionally~~, ports may approach a particular system with a degree of flexibility or ‘plasticity’ (Notteboom et al., 2013).

~~Also~~What is more, in a port governance reform context, policy goals may influence the understandings of key terms. For example, ‘impact’ is defined or equated with ‘success’ or ‘failure’, yet ‘success’ and ‘failure’ are multifaceted and highly complex. ‘Success’ can be measured in terms of effectiveness (in terms of strategies) and also efficiency (e.g. in terms of faster vessel turnaround) (Brooks and Pallis, 2008). ‘Success’ may depend on the size of the port; for example, private investment may only occur if a port is sufficiently large enough to offset risk (Debie et al., 2013). Thus, a privatization policy may only ‘succeed’ in a larger port-size area. It may even be the case that the ‘success’ of a decentralization policy on the part of the government may ~~lead to be that~~ the government finally ceases to have any ‘impact’ at all, each port having an “autonomous, self-financing Port Administration, so that the government has only a supervisory role over the system” (Estache et al., 2002, p. 547). Moreover, ‘success’ can be equated with government policy achievement but with significant loss to the taxpayer. For example, in the UK, the 1980s’ Thatcher government’s selling of ports at a 75% reduction in their value represented ‘success’ for government policy, but not ‘success’ for taxpayers (Saundry and Turnbull, 1997; Baird and Valentine, 2006). As Lee and Flynn (2011, p.793) have noted, the Anglo-Saxon model of port governance adopted in the UK has the overall goal of profitability, as opposed to the European model adopted elsewhere in Europe that “views the port as a part of the social infrastructure for the national economy.” Furthermore, in contrast to these models, the Asian doctrine differs in that it sees significant investment to drive and stimulate economic growth (ibid.).- In each case any ‘impact’ will of necessity need to be measured differently given the different underlying aims and goals of the reform, and again may have differing short-run and long-run outcomes.

~~In addition to individual variety and ambiguity, some key terms are very close to each other in definition, or require definition by contrast with other terms. For example, “there is only a thin line between cooperation and competition” (Wang et al., 2012, p. 404). Further, ‘devolution’ can consist of many stages, involve many elements (Vieira et al., 2014), and is a much broader concept than ‘privatisation’ (Vieira et al., 2014). ‘Privatisation’ itself should also be considered distinct from ‘commercialization’, as the latter retains more control for governments (Brooks and Cullinane, 2006).~~

Another important consideration regarding how words are understood is that, although not always (Bergqvist and Cullinane, 2016), certain policies are often ~~assumed to lead to~~assumed to lead to specific outcomes. For example, it is tacitly assumed that ‘privatisation’ from public sector control to company control increases competition and efficiency, as it has “the main objective... to decrease direct government control over the company and to make it more responsive to market forces” (World Bank, 2000, module 2, p. 46, cited in Pallis and Syriopoulos, 2007). Indeed, “privatization is perceived to be the most important policy for improving the efficiency of the ports sector (Cullinane et al., 2002)” (Tongzon and Heng, 2005, p. 408). Yet, privatisation, *per se*, may not increase port efficiency or competitiveness, certainly not in ‘green port’ initiatives, as it is “unrealistic to think that the highly capital-intensive and high-risk areas in clean technology will be ‘led’ by venture capital, or ‘nudged’ by a small and unstructured green investment bank” (Mazzucato, 2013, p. 196). Indeed, in Australia, the inefficiency of how certain private companies ran the ports “led to calls for a single national regulator for Australia’s ports (Pettitt, 2007, p125-6). Nor may ‘privatisation’ *per se* be the root cause of any efficiency gains that occur. For example, it could be argued that post-privatization UK ports are the most efficient in Europe (Cullinane and Wang, 2006a, Wang and Cullinane, 2006) not because of privatization *per se*, but because of the deregulation of employment and abolition of the National Dock Labour Scheme (Saundry and Turnbull, 1997). ~~Such~~Any tacit assumptions ~~with regard to key terms~~ have an immediate bearing on the viability of being able to measure the impact of any reform as they may bias the expectations and questions asked.

Although such aspects as we note here regarding words and their understanding are highlighted in the literature, as is manifestly shown above by the literature cited, the bearing they have when considered in their totality upon the viability of measuring the impact of port governance reform is not. Nevertheless, much research is done through approaches that will very much depend on words, such as textual analyses of agendas (Cariou et al. 2014), questionnaires (Brooks and Pallis, 2008) and surveys (Verhoeven and Vanoutrive, 2012). Yet, participants, researchers, and policy makers may have differing understandings of words, and these interpretations may bias the results, and thus what they reveal about any ‘impact’. ~~We argue that if policy makers and researchers carefully consider these possibly different understandings, they will have a clearer understanding of the limits and expectations of their own aims and outcomes.~~ For policy makers, we would suggest that such considerations be built into legislation in the form of an inbuilt evaluation plan that is constructed at the same time as the port governance reform legislation is constructed. This could be done as part of an evaluation plan similar to one done by Transport Scotland (2015) to evaluate the introduction of rail fare increases. Although port governance reform is undoubtedly more complex, building such considerations into an evaluation plan from the outset clearly sets out the parameters and considerations for the measurement of any impact. Such enhanced understandings will help make the measurement of any impact more viable, and help contextualise the findings. Table 1 classifies these issues and offers suggestions for policy maker and researcher perspectives regarding how to consider them in measuring the impact of port governance reform. Although we present policy maker and researcher perspectives separately, we note that policy makers and researchers often work together, and that often these roles actually overlap in that policy makers are sometimes also researchers in central units of transportation.

**Table 1. Issues related to key terms and suggestions for considering these in measuring the impact of port governance reform.**

<u>Issues</u>	<u>Suggestions</u>
<u>Key terms can be ambiguous.</u>	<p><b><u>Policy maker perspective:</u></b> define key terms such as ‘governance’, ‘impact’, or ‘success’ in any policy. Include these in a pre-defined policy evaluation plan.</p> <p><b><u>Researcher perspective:</u></b> check participants’ understanding of terms is the same as those in any research tools</p>
<u>Key terms may have different ‘boundaries’.</u>	<p><b><u>Policy maker perspective:</u></b> define the boundaries of terms such as ‘port’ or ‘hinterland’ related to the policy.</p> <p><b><u>Researcher perspective:</u></b> check participants’ understand boundaries of terms such as ‘port’ in line with those in research tools.</p>
<u>Policy goals influence understandings of key concepts</u>	<p><b><u>Policy maker perspective:</u></b> carefully define key terms such as ‘success’, ‘impact’ or ‘failure’ and how they will be evidenced in the context of the policy.</p> <p><b><u>Researcher perspective:</u></b> explore ‘success’, ‘impact’ and other key goals and aims in the context of the specific policy.</p>
<u>Differing assumptions of key concepts</u>	<p><b><u>Policy maker perspective:</u></b> always seek evidence to support the assumptions (e.g. does privatisation increase profits as is assumed) underpinning the goals of policy.</p> <p><b><u>Researcher perspective:</u></b> explore and be conscious of assumptions (e.g. does privatisation increase profits as is assumed) underneath policy claims and goals.</p>



### 3. Aspects of time and geography

A key aspect related to time in the impact of port governance reform is transition, as “all... changes are accompanied by lengthy, transition times” (Brooks and Pallis, 2008, p. 414). Notably, “only after this transition period... [is it] possible to accurately understand how the model performs” (Brooks and Pallis, 2008, p. 416). Significantly, it is often extremely hard to pinpoint when such transition has ended. In Taiwan, the reforms of 2012 had an adjustment period for a number of years (Tseng and Pilcher, 2016). In China, Cullinane and Wang (2006a, p.343) noted of China’s new port law in 2004, that, “it is still too early to tell whether the latest phase of reforms will prove to be successful in solving China’s port problems” (Cullinane and Wang, 2006a, p. 343). Similarly, in a Greek context, “it has to be acknowledged that as national port reforms began less than ten years ago the governance of Greek ports is still in a state of flux” (Pallis, 2007, p. 377). In addition to transition, any reform is inevitably part of a chain of policies: “the process of change is a dynamic one, and... the performance outcome of a reform process influences the next round of reforms” (Brooks and Pallis 2008, p. 411). Clearly, if transition is incomplete, it will be unclear whether the situation examined was the result of the reform or of a previous policy, particularly if the current situation had been influenced by previous ones.

Another aspect of time relates towards pace: i.e. that the pace of research may be behind the pace of the reform. Writing about China in 2016, Notteboom and Yang (2016, p. 6) note that “in the past decade, the process of corporate governance reform has only accelerated” given China’s increasingly prominent global role and “the many fiscal, financial, social and environmental challenges it is confronted with” (ibid). This contrasts with the previously slow pace of reform in China (Cullinane and Wang, 2006a). This inevitably affects~~has a significant bearing on the viability of~~ any attempt to measure the reform, as, by the time the results are published, the government may have already introduced a further reform. It is thus essential that research keep pace with reform. Also, as noted above, some reforms may have short-run and long-run effects and impacts. For example, public-private partnerships may have positive short run effects in terms of saving costs for the public bodies, or increased profits for the private companies. However, the long-run effects may be harder to measure. Arguably, policy makers and researchers need to take care to delineate between these effects, perhaps using econometric models (see below) to measure any effects over time as well as cross-sectionally.

~~A further time-related aspect that has a strong bearing on the viability of any attempt to measure the impact of port governance reform is that ports who first introduce a reform may have an advantage over others, but this may be reduced as other ports follow suit. In Argentina, writing in 2005, Serebrisky and Trujillo noted that, “as other countries in the region have now adopted similar reforms, Argentina’s first-mover advantage seems to be rapidly eroding” (Serebrisky and Trujillo, 2005, p. 205). Such temporal aspects can also work with forcing ports to adopt change. For example, as Wang et al. (2012, p. 386) note with regard to Hong Kong, recent political changes within the region meant it was “compelled to undergo strategic changes” in its port governance, to integrate itself within the Pearl River Delta, “so as to establish a system with different PRD ports that is functionally complementary to each other.” Clearly, such aspects mean that rather than reveal the impact of a particular reform, what the findings may show is simply how such a reform has had an effect at that particular time, in the context of its introduction before others have done so, or how the reform itself was forced upon a particular government by events. Paradoxically, the reform itself may occur from the impact of other events rather than there being any need to research its impact *per se*.~~

~~Another further~~ aspect related to time is the broader global change in ideological perceptions and approaches to the economy. The rise of the neo-liberal paradigm in the 1980s (Müller, 2005) meant that, “a new dominant discourse imposed itself as the framework of action and thought for political actors: (1) the ideal society is the market society, (2) good market functioning is guaranteed by competition, and (3) the private sector is more efficient than the public sector” (Debie et al., 2013, p. 58). Indeed, ideological underpinnings can become unfashionable, for example in Italy, the reforms of the 1980s and 1990s were undertaken based on: “characteristics that are not found in the current transport set up” (Ferrari and Musso, 2011, p. 336). Similarly, in Spain, the policies towards ports after 1992 were undertaken in a different ideological climate (Núñez-Sánchez and Coto-Millán, 2012, p. 101). Clearly, such differences will have a strong bearing on any research into the impact of reform, and will need to be considered in contextualising any research undertaken as this will need to be framed within the ideological goals of the time, giving such reform a temporary and transitional character, that may reduce its veracity and also endanger its independence

A further time-related aspect that has a strong bearing on the viability of any attempt to measure the impact of port governance reform is that ports who first introduce a reform may have a ‘leader’ advantage over others, but this may diminish as other ports follow suit. In Argentina, writing in 2005, Serebrisky and Trujillo noted that, “as other countries in the region have now adopted similar reforms, Argentina’s first-mover advantage seems to be rapidly eroding” (Serebrisky and Trujillo, 2005, p. 205). Such temporal aspects can also work with forcing ports to adopt change. For example, as Wang et al. (2012, p. 386) note with regard to Hong Kong, recent political changes within the region meant it was “compelled to undergo strategic changes” in its port governance, to integrate itself within the Pearl River Delta, “so as to establish a system with different PRD ports that is functionally complementary to each other.” Clearly, such aspects mean that rather than reveal the impact of a particular reform, what the findings may show is simply how such a reform has had an effect at that particular time, in the context of its introduction before others have done so, or how the reform itself was forced upon a particular government by events.

Regarding aspects of geography, variety is huge. As Chiu and Yen (2015, p. 14) observe, “because port reforms in various countries have unique motivations, incentives, and goals, no consensus has been reached regarding the relationship between port governance and related performance.” There is huge variety both ~~in the vast range~~ in different models worldwide and in how ~~theysuch models~~ are implemented. As Debie et al.’s (2013, p. 58) ~~baldly~~ state: “our analysis adheres to the proposition that there is not geographic convergence, but rather complex re-composition and hybridization of models in specific territorial contexts.” Similarly, Ng and Pallis (2010) note the importance that political and cultural traditions play in influencing port governance reform.

~~Geographically, there is huge variety in port governance models and approaches.~~ In Europe there are Latin and Hanseatic port governance models, the former having more central government control over Port Authority (PA) activities, the latter being more municipal government controlled (Ferrari et al., 2015). In the Iberian peninsula, there may be intense competition between ports (Castillo-Manzano and Asencio-Flores (2012). In Japan, maritime activity is very much related to the living space, in France ~~an~~ emphasis is placed upon “the heritage aspects of the living environment” whereas in the Netherlands “national strategy choices are guided by the concept of ‘entrance gates’ which elevate the status of the two main ports” (Debie et al., 2013, p. 61). In Canada, however, the emphasis is more on encouraging port infrastructure to work with private companies (Ircha, 2001), and particularly to increase collaboration in the aftermath of the early twentieth century recession (Heaver, 2015). Australia is moving towards a private/public governance model (Chen et al., 2016), multiple concession agreements are used in Cyprus (Panayides et al., 2016).

The actual processes of port reform also differ. In Europe alone, Belgium and Germany have focused on the corporatization of some PAs; France and the UK have implemented a multi-stage national reform and; Italy has had one overarching law of port reform (Ferrari et al., 2015). What is more, even in individual countries, ports can differ greatly in the fees they charge and the policies adopted by PAs to encourage investment (e.g. Italy (Parola et al., 2012).

Notably, in Europe, there is continual tension between allowing countries freedom of movement to enact their own reforms and approaches, yet at the same time having a “need to have an overarching continental framework that might, firstly, guarantee transparency (and subsequently efficiency) in the competition among European ports and, secondly, also offer the ports the right incentives to insert clauses and to introduce a common regulatory approach” (Ferrari et al., 2015, p. 66, cf. Haralambides et al., 2001; Verhoeven, 2009). In addition, that ports worldwide have huge variety in both their roles and also their stages of development. In China, for example, Qinghuangdao is a dry bulk port, Shanghai more diversified, and of 13 ports studied by Notteboom and Yang (2016, p. 3) “major differences can be observed when comparing the growth paths”. Indeed, China has four port regions with particular industrial specializations, in very different stages of development, and whereas “eastern China has accomplished the industrialization process... the rest of China is in the late industrialization phase” (Song and Geenhuizen, 2014, p. 181). What this may mean for any policies or reform regarding competition is that “entrance within the older established ports... may for the time being encounter thicker internal governance problems” (Wang et al., 2004, p. 249). Such geographical aspects have a bearing on the viability of measuring the impact of any reform for policy makers as what they mean is that a study on a particular model or process of reform in one area may have limited applicability elsewhere. Thus, although that Taiwan’s recent port reform drew on the structure of the success of Singapore’s port governance (Chiu and Yen, 2015), Singapore’s successes may not have been transferable given the differences in the ports in Taiwan and Singapore.

The limitation of such applicability is further amplified by the fact that ports worldwide have huge variety in both their roles and also their stages of development. In China, for example, Qinghuangdao is a dry bulk port, Shanghai more diversified, and of 13 ports studied by Notteboom and Yang (2016, p. 3) “major differences can be observed when comparing the growth paths”. Indeed, China has four port regions with particular industrial specializations, in very different stages of development, and whereas “eastern China has accomplished the industrialization process... the rest of China is in the late industrialization phase” (Song and Geenhuizen, 2014, p. 181). What this may mean for any policies or reform regarding competition is that “entrance within the older established ports... may for the time being encounter thicker internal governance problems” (Wang et al., 2004, p. 249).

Arguably, these issues of time and geography compound the challenges researchers and policy makers are faced with in are faced with serious challenges to the viability of any attempt to measure the impact of port governance reforms by these aspects of time and geography. Lengthy transition times, changes in the pace of reform, the order the reform is introduced when compared to others in the region all have significant influences upon the viability of any research into impact. Further Similarly, the huge variety over the world in terms of models, processes and the stages of development of particular ports and their roles and purpose also have strong bearings upon any findings. We argue that considering such aspects will help make the measurement of any impact more viable, and help contextualise the findings. Table 2 classifies these issues and provides suggestions for how to consider them in any research into the impact of port governance reform:



**Table 2. Issues related to aspects of time and geography and suggestions for considering these in the impact of port governance reform.**

<b><u>Issues</u></b>	<b><u>Suggestions</u></b>
<b><u>Transition time may be lengthy and pace of the reform may be quick.</u></b>	<p><b><u>Policy maker perspective:</u></b> stipulate when transition will occur and what the pace of the reform should be. Include these in a pre-defined policy evaluation plan.</p> <p><b><u>Researcher perspective:</u></b> account for transition to isolate the impact of previous and newly introduced policy. Try to match the pace of research and reform.</p>
<b><u>Reform may reflect current ideology, and its impact related to others introducing similar reforms</u></b>	<p><b><u>Policy maker perspective:</u></b> stipulate how reform should be measured in line with current ideology, and judge impact related to how others introduce similar reform.</p> <p><b><u>Researcher perspective:</u></b> study reform in the context of its ideology and consider impact related to when others have introduced similar reforms.</p>
<b><u>Models adopted globally differ greatly, as do the roles of individual ports</u></b>	<p><b><u>Policy maker perspective:</u></b> evaluate impact specific with the model adopted and the role of the port. Compare with others experiences but consider contextual differences.</p> <p><b><u>Researcher perspective:</u></b> evaluate impact by specific model and port role. Compare with others but factor in contextual differences.</p>
<b><u>Interaction and influence of reform by other governments</u></b>	<p><b><u>Policy maker perspective:</u></b> consider any impact of a reform in the context reforms introduced by others considering how these interact with and influence the reform introduced.</p> <p><b><u>Researcher perspective:</u></b> consider the interaction of the reform with reforms elsewhere and how these may influence any impact.</p>

#### **4. Issues of methods and context**

The huge range of methodological approaches and methods used in any research into the impact of port governance reform arguably means the findings differs greatly. Research can be done in economic terms, “from the standpoint of technical efficiency, cost efficiency and effectiveness by comparing the port’s actual throughput with its economic technically efficient, cost efficient and effectiveness optimum throughput, respectively” (Talley, 2006). Data Envelopment Analysis (Cullinane and Wang, 2006b) draws on cross-sectional or panel data to calculate port efficiency, and comparison with benchmarks (Bichou, 2007) measures port efficiency. By comparison, stochastic frontier models can go beyond cross-sectional time capture to include time-varying data and thus study data over time (Cullinane et al, 2002; Wang et al, 2013). Similarly, other models study data over time in regression (Wu et al., 2016), and finance related econometric models have been used to help forecast future price changes and volatility, for example in dry bulk and tanker markets (Glen, 2006). Also, real option approaches are another econometric model used by Zheng and Negenborn (2017) to analyse investment timing decisions in a port context. Importantly, whilst such models have focused

on the impacts of specific elements such as demand uncertainty, Zheng and Negenborn (ibid, p.408) note that “other factors could be incorporated into our models in the future.” Another approach has been for a broader social sciences one, for example that of Wang and Slack, which ~~would~~ allow for “greater weight of social and cultural variables” (Brooks and Pallis, 2008, p. 413), or that of Baltazar and Brooks, endorsing a “corporate governance approach to analyse port governance” (Brooks and Pallis, 2008, p. 413). Elsewhere, case study methodology is noted to be common (Chiu and Yen, 2015), conceptual frameworks have been developed (Brooks and Pallis, 2008), and quantitative surveys are undertaken (Verhoeven and Vanoutrive, 2012).

Notably, in terms of considering which method to adopt, “the attributes of importance cannot be useful when statically evaluated at a single point of time. Port performance is dynamic” (Brooks and Pallis, 2008, p. 420). Arguably, reliance on any one methodology or method in attempting to measure the impact of port governance reform, given the huge challenges involved, means that the picture attained may~~will~~ be skewed and limited. Vieira et al. (2014, p. 645) note, most studies are qualitative, and although, “existing models make a contribution, they allow gaps in terms of evaluating governance outcomes, identifying governance elements and discussing governance actions.” In turn, “these gaps make it hard to answer the basic questions associated with governance models: Who governs? What is governed? How is it governed? and For what is it governed?” (ibid).

Concomitantly, it is arguable that models and quantitative approaches may fail to account for the elements that qualitative studies will reveal. For example, the Malmquist Productivity Index (MPI) has been used to quantitatively measure port reform, with the conclusion that, “most significantly, port ownership restructuring has generally contributed to total factor productivity gains.... rather than through decentralization and corporatization at the port-authority level” (Cheon et al., 2010, p. 558). However, there are arguably a number of aspects that, given its reliability on numbers, the MPI cannot include. For example, in Taiwan, Chiu and Yen (2015, p. 20) note that “numerous aged employees in port authorities have exhibited various generally counterproductive work behaviours.” Elsewhere, corruption, or “the will to root out corruption” (Fraser and Notteboom, 2016, p. 66, cf. Tupy and Rohac, 2014) has been found to impact on port performance. As noted by Orrell and McSharry (2009, p734) “numerical models are.... only approximations to reality, and are often highly sensitive to external influences and small changes in parameterisation.” Nevertheless, econometric models can measure over time, and they can measure certain aspects, it just may be the case that sacrifices need to be made in what the intended aspect to measure is. For example, in forecasting, balances may need to be made between a business’s operational requirements and the desire to find a good model and achieve high accuracy. As Nielsen et al (2014, p.682) note, “one cannot necessarily achieve everything, but must trade off various performance measures.”

~~Also, it is possible that key political or economic events totally unrelated to the reform could drive performance, for example, in the case of China, China’s accession to the World Trade Organization, thereby giving overseas investors greater opportunities (Cullinane and Wang, 2006a). Further, in Argentina, port figures showing “a notable increase in 2003 due to the partial recovery of the Argentine economy” (Serebrisky and Trujillo, 2005, p. 198). If such elements are key to port performance, how viable is it to rely on quantitative methods such as the MPI, or any method that considers numbers alone, to conclude that the results found are attributable to the impact of port governance reform and not to other outside factors?. And yet, as Vieira et al. (2014) note, qualitative based studies also leave key gaps in the ability to measure the impact of any reform given their failure to consider quantitative evidence.~~

Another important methodological aspect is that there may be issues with significant limits to what the data is available. For example, although port labour is highly~~very~~ complex in structure, “currently, there is no reliable database of collective information on labor at world

ports” (Cheon et al., 2010, p. 552). Further, as Brooks and Pallis note (2008, p. 412) “in several cases, the public sector retains only a supervisory and monitoring role; in others, like the UK, there is no national port monitoring agency” and ports may fail to collect data for many areas (ibid.) What is more, in their study of performance, of the ~~twelve~~<sup>12</sup> authorities they asked for data, “only seven of the 12 answered the performance measurement part of the questionnaire! We concluded that this is a clear sign that comprehensive performance measurement programs are not practiced in a substantial number of ports” (Brooks and Pallis, 2008, p. 422). Comparatively, Verhoeven and Vanoutrive (2012) found a wide range in response rates to their surveys in different countries, some very high (e.g. Belgium) but others very low (e.g. Greece). As Brooks and Pallis allude to, it may be the case that some data may not ~~want to~~ be released into the public sphere by the PAsAs: “the number of indicators reported (or the Port Authorities *were willing to disclose*) is substantially lower than expected” ~~[our italics]~~ (Brooks and Pallis, 2008, p. 424 ~~[our italics]~~). Certainly in the case of the UK, public data is accessible through Freedom of Information requests, but Private data is not, and may be withheld for reasons of, for example, competition (UCL, 2016). In addition, as Ferrari et al. (2015, p. 62) note, PAs are both regulators but also “port promoters”, thus they may be reluctant to be negative about ports. As Cheon et al. (2010) note, often only successful ports allow data to be studied.

Sometimes, potential bias in some of the data is actually suggested in studies: “the only port authority that stated it collects invoice accuracy reported a 100% accuracy, allowing us to question whether this more a qualitative assessment rather than a quantitative measurement” (Brooks and Pallis, 2008, p. 427). Importantly: “governance decisions, both at firm and government levels, are largely based on this partial assessment of port performance-” (Brooks and Pallis, 2008, p. 412).

Also, the type of data available has changed over time, and improvements to data sets are continually suggested. For example, the European Commission suggested that, “there is a need for alternative ‘generic’ indicators, beyond efficiency indicators, in order to address issues such as like spatial and ‘green’ port development as well as providing a mechanism for introducing port users’ perception of European ports performance to decision making” (Brooks and Pallis, 2008, p. 418). Nevertheless, despite all these issues, data gathering is becoming more comprehensive, for example China has seen, “major advances in moving from a statistical reporting system of a centrally planned economy to a modern system following international statistics collection and reporting methods” (Notteboom and Yang, 2016, p. 8). In addition to the data used, the methods of studying state based analytical units is questioned, given that today “globalization continues to upset, deconstruct and rework the foundations of society” (Roe, 2012, p. 79). Roe (2009b) suggests different analytical units be used to study and consider port governance from a global dimension, at a multi-governmental level that covers specialised jurisdictions, and also from a polycentric perspective that considers policies from all types of institution including government and also interest groups, but whether such research is viable is questionable given that it may be funded by state-based units themselves.

Another key issue in any research is that, it is possible that key political or economic events unrelated to the reform could drive performance. For example, in the case of China, China’s accession to the World Trade Organization, thereby giving overseas investors greater opportunities (Cullinane and Wang, 2006a). Further, in Argentina, port figures showing “a notable increase in 2003 due to the partial recovery of the Argentine economy” (Serebrisky and Trujillo, 2005, p. 198). If such elements are key to port performance, how viable is it to rely on quantitative methods such as the MPI, or any method that considers numbers alone, to conclude that the results found are attributable to the impact of port governance reform and not to other outside factors? And yet, as Vieira et al. (2014) note, qualitative based studies also leave key gaps in the ability to measure the impact of any reform given their failure to consider

quantitative evidence. Perhaps one way forward therefore is to consider multidisciplinary approaches and to develop econometric models further in a combined approach.

Regarding aspects related to the port contexts, the influence of non-port context aspects on port performance (e.g. hinterland connections and infrastructure) and how these differ according to area (Pallis, 2006) is key. Even port-related activities themselves are highly heterogeneous in nature, which “makes it difficult to consider port industry as a whole, at least regarding the estimation of cost and production functions and, therefore, it is preferable to centre the analysis on a particular activity” (Gonzalez and Trujillo, 2008, p. 245). Furthermore, “even when focusing the study on a specific activity, there is still diversity. A port not only renders services to vessels but also to passengers and cargo. Moreover, the cargo cannot be considered as a homogenous good, since each type of commodity calls for very specific loading/unloading devices” (ibid, p. 246).

Indeed, contextually, there may be other factors behind the strong performance of a port and not simply port reform (Tongzon, 2008). For example, advances in technology meant that “the employment level in the Port of Buenos Aires dropped from about 8,300 in 1992 to about 1,600 in 2000 with most of the cut resulting from the reduction in the size of the stevedoring business” (Serebrisky and Trujillo, 2005, p. 198). Despite this, it is often the case that conclusions are drawn that the improvements that any measurements show have been a result of governance reform. For example, the move to a landlord model in Spain has been noted to have impacted on technological change, if not on technical efficiency, but that nevertheless, “there is however a significant movement of the efficiency within ports over time as a result of reforms” (Gonzalez and Trujillo, 2008, p. 254). Also in a Spanish context: “during the first years of the decentralisation process of the port authorities in Spain, both the scale-efficiency gains and the technical change gains improved” (Núñez-Sánchez and Coto-Millán, 2012, p. 106). Further, that in Argentina, “the evidence of the 1990s suggests that the reforms have paid off so far. Argentina’s ports allowed the absorption of a fourfold increase in container traffic from 249,000 TEUs (twenty-foot equivalent units) in 1990 to 1,070,000 TEUs in 2000” (Serebrisky and Trujillo, 2005, p. 192). It is even claimed that reform has had both positive effects and also negative ones depending on the stage of the reform (e.g. in Spain (Rodríguez-Álvarez and Tovar, 2012)).

Yet, whether such the results illustrate the impact of the port governance reform itself, or are the result of wider contextual aspects is a key issue/question. For example, in Taiwan, ship numbers and operational efficiency were markedly reduced during the financial crisis (Tseng and Pilcher, 2016), but after the reforms of 2012 there was little difference. Whether the reforms then have made any impact is arguably an issue that needs to be considered through an attempt to a moot consideration, as it is extremely challenging to identify and isolate their impact in the context of wider events. Similarly, in terms of the context of the reform itself, rather than being specifically one targeted at the port governance sector, it could be part of a wider introduction of reforms. For example, in Italy, the 84/94 law occurred in the context of a “European initiative that encouraged the de-verticalization of the transport industry and the privatization of the production of the transport services” (Ferrari and Musso, 2011, p. 335) and port reforms in Italy were part of a raft of reforms to the transport sector. Further, the type of industry involved can determine the type of governance structure adopted rather than the other way around. As Syriopoulos and Tastsaronis (2011, p.601) note: “past empirical evidence indicates that industry factors can play an important role in corporate governance” of shipping firms. There is thus the danger of confounding cause and effect (Nietzsche, 1888), and of assuming that the reform has had an impact when the results are due to other factors. We argue this has a significant bearing on the viability of any attempt to measure the impact of port

governance reform as if it is not possible to isolate the specific reform from other factors and other reforms, it is extremely challenging to research its impact.

[Table 3 classifies these issues and provides suggestions for how to consider them in any research into the impact of port governance reform:](#)

**[Table 3. Issues related to methods and contexts and suggestions for considering these in the impact of port governance reform](#)**

<b><a href="#">Issues</a></b>	<b><a href="#">Suggestions</a></b>
<b><a href="#">Particular methods have particular abilities and facets</a></b>	<b><a href="#">Policy maker perspective:</a></b> <a href="#">define what is achievable in terms of measurement over time, select methods accordingly, perhaps a range. Include these in a pre-defined policy evaluation plan.</a> <b><a href="#">Researcher perspective:</a></b> <a href="#">continue to develop and improve existing methods.</a>
<b><a href="#">Data may be limited and biased.</a></b>	<b><a href="#">Policy maker perspective:</a></b> <a href="#">ensure data is as widely available and objective as possible. Build in data collection procedures to any pre-determined policy evaluation plan.</a> <b><a href="#">Researcher perspective:</a></b> <a href="#">continue to contextualise results within the space of the data available.</a>
<b><a href="#">The policy itself may be an impact, and outcomes may be caused by other factors than the policy.</a></b>	<b><a href="#">Policy maker perspective:</a></b> <a href="#">consider if the policy itself is a result of the impact of something, and whether impact actually needs to be measured. Also consider how any results could be caused by other factors than the policy</a> <b><a href="#">Researcher perspective:</a></b> <a href="#">ascertain as far as possible if outcomes can be linked to the policy itself, or if other factors have been the cause.</a>
<b><a href="#">Events happening in the wider context may be key.</a></b>	<b><a href="#">Policy maker perspective:</a></b> <a href="#">consider the extent of what the policy can do within a wider global economic context.</a> <b><a href="#">Researcher perspective:</a></b> <a href="#">consider the results of any policy within wider global economic and political contexts.</a>

## 5. Conclusion

Researching the impact of port governance reform is ~~a key area of research and~~ extremely important for researchers, funders and policy makers (Pallis et al., 2011). Often, allusions are made in the literature to the challenges involved with researching port governance reform (e.g. Brooks and Pallis, 2008; Roe, 2009<sup>a</sup>) but the fundamental assumption is made that such research can be undertaken. In this paper, which is essentially a polemical paper informed by the literature, we have asked the question ‘Can we really measure the impact of port governance reform?’ To do this we have critically considered what we feel are three salient areas in relation to whether we can really measure the impact of port governance reform: ‘words and their understandings’, ‘aspects of time and geography’ and ‘issues of methods and context’. From this critical consideration, [we have summarised these issue in Tables 1,2 and 3, and offered suggestions for policy makers and researchers to try to help strengthen any research into the impact of port governance reform](#)~~in terms of words and their understandings, we argue it is essential carefully consider participants’ understandings and definitions of the key terms~~



involved are. We would suggest the terms above we considered are key, such as ‘governance’, ‘port’, ‘success’, ‘failure’, ‘impact’, ‘privatization’, and ‘decentralization’, although we fully understand and highlight that this list is by no means exhaustive. Secondly, regarding aspects of time and geography, ‘transition’ and relation of the reform to others in a chain are key considerations. Further, to consider policies and approaches elsewhere, and within part of a wider range of ideological approaches current at the time, and in light of what events are happening globally at the time. Geographically, any attempt to measure the impact of reform should consider what others nearby are doing, what the port’s purpose is and its specific model compared to others around it. With regard to aspects of ‘methodology’ and ‘context’, we argue it is essential to consider the nature of the method chosen, what it can cover, what it omits, and therefore what can be concluded from it. Further, the nature of the data, its extent, its quality, whether there may be any issues of bias, and what all these elements mean for the viability of measuring the impact of the reform are key. In addition, regarding context, to consider aspects outside the port that can impact on the port itself, and also to consider other wider current events. We note that our list here is by no means exhaustive, and that it is also subjectively based upon our own interpretations of what should be considered that have occurred to us the authors as we have undertaken our review of the literature and also have ourselves researched port governance reform. Our paper inevitably has a number of limitations. Firstly, our paper is limited to the three areas we have considered but others may also have an important bearing. Secondly, port governance reform is a continually moving target and is continually changing and developing, thus, our observations may become outdated very quickly. Thirdly, we make a number of suggestions, but whether these will work, and how feasible they actually are in practice remains to be seen. Nevertheless, despite such limitations, we argue that the three areas we have considered are key, further than although port governance reform is continually changing, the issues involved will have some relevance, and also that the suggestions we make are worthy of consideration in any study to measure the impact of port governance reform. In particular, we consider that further work in the evaluation of the impact of port governance reform in terms of developing prepared evaluation plans that can be embedded in policy and legislation bears great promise. ~~W~~Nevertheless, we hope ~~nevertheless~~ that what we have outlined ~~above~~ can help ~~researchers and~~ policy makers ~~and researchers by in their attempts enhancing our ability~~ to positively answer the question ‘Can we really measure the impact of port governance reform?’

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