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**These Little PIIGS Went to Market: Austerity
and Divergent Recovery in the Eurozone**

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These Little PIIGS Went to Market: Austerity and Divergent Recovery in the Eurozone

Samuel Brazys and Aidan Regan¹

Abstract: The 2008 financial crisis hit few places harder than the European periphery. Faced with high levels of public debt, Portugal, Italy, Ireland, Greece and Spain (the PIIGS) were each compelled to implement harsh austerity reforms. Yet despite this common policy response, the recoveries, particularly in Ireland, have shown significant divergence. We challenge the prevailing narrative that Ireland's export-led recovery from the crisis is due to austerity induced cost competitiveness. Instead, we argue that Ireland's state-led *enterprise policy* situated the country to be a recipient of foreign direct investment driven by the low borrowing costs, brought on by the United States' Quantitative Easing (QE) programs. Using quantitative and qualitative investigation we find evidence that this state-led enterprise policy mechanism, rather than austerity-induced cost competitiveness, kick started Ireland's export growth engine. As Ireland is a critical case for the "success" story of austerity in Europe, our findings represent a significant challenge to the politics of adjustment in the Eurozone.

Keywords: Austerity, Crisis, Debt, Ireland, PIIGS, Enterprise Policy

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“Greece has a role model and that role model is Ireland²”

Jean Claude-Trichet, as President of the European Central Bank (2010)

The fury of the 2008 housing and financial crisis struck few places harder than in the countries of the Eurozone periphery. Massive shocks to growth, employment and public finance plunged Portugal, Greece and Ireland into international bailouts and brought Spain and Italy to the brink of that shared fate. Financial markets, seizing on the long tradition of considering the poorer performing Southern European economies as “Club Med”, quickly brought Ireland into the group, with the now infamous political re-branding using the inflammatory moniker “PIIGS”. This heuristic became synonymous with the crisis in the European periphery and has since been shown to have driven convergent financial market treatment of the constituent members during the crisis (Brazys and Hardiman 2015). Despite qualitatively distinct political economies, domestic problems, and national growth regimes, all countries were treated similarly with the implication that their bond yields soared above the Euro area core (Kinsella 2012, Johnston & Regan 2015; Iversen et al 2016; Hall 2014).

The PIIGS’ common entry into crisis led to a *common* policy response of “austerity”. These austere adjustments included macroeconomic stabilization, fiscal consolidation and supply-side structural reforms, coordinated by the so-called “Troika” of international institutions: the European Commission (EC), the European Central Bank (ECB), and the International Monetary Fund (IMF) (Blyth 2013). Austerity measures resulted in notable social consequences – ranging from economic and electoral (Whiteley, Clarke, Sanders and Stewart 2015), to health related (McKee, Karanikolos, Belcher and Stuckler 2012), and have generated high-profile public critiques (for example see Krugman 2012). The wisdom of the policy approach remains an open question and has generated an intense political and technical debate between economists within the Troika institutions, with the IMF

² Quoted from European parliament speech, March 24th 2010.
<https://www.ecb.europa.eu/press/key/date/2010/html/sp100325.en.html>

(Blanchard and Leigh 2013) and the ECB contradicting each other's research (Warmedinger, Checherita-Westphal and De Cos 2015). The austerity agenda received a crushing blow when a team of economists at the University of Massachusetts (Herndon, Ash, & Pollin, 2014) found a simple but meaningful data error in the economic research (Reinhart & Rogoff, 2010) that had been regularly cited by the European Commission to legitimate policy adjustments in the PIIGS countries.

As suggested by the quote at the start of this paper, a significant portion of the remaining support for the contention that austerity "works" revolves around the perceived success of the policies in Ireland. Both the European Commission³ and the Irish government⁴ have argued that Ireland's political commitment to austerity have been central to its recovery. This makes Ireland a "crucial case" for supporting the narrative that austerity measures can be a useful policy prescription (Gerring, 2004). Indeed, after implementing an internal adjustment equivalent to 26 per cent of gross domestic product (GDP), Ireland has become one of the fastest growing economies in Europe, exceeding the other 'PIGS' and the aggregate EU growth rate since 2011, leading the OECD to describe Ireland as the "comeback kid" of the Euro periphery⁵. The supposed success of the adjustment usually runs as follows: austerity has reduced labor costs, which in turn has enabled export firms to improve their competitiveness and expand external demand, which, in turn, has attracted new firms to invest in a more cost competitive environment (Schäuble 2011, Buti et al 2012, Chen et al 2012, Sinn 2014; see Storm and Naastepad 2014 for a critique). The

³ <http://www.breakingnews.ie/ireland/barroso-to-praise-people-of-ireland-for-courage-sacrifice-during-bailout-624243.html> Accessed 15-06-15.

<http://www.wsj.com/articles/SB10001424052702304911104576445583071882782> Accessed 15-06-15.
<http://www.irishtimes.com/business/economy/austerity-policies-work-claim-ecb-economists-1.2244944> Accessed 15-06-15.

⁴ <http://www.independent.ie/business/world/the-axeman-cometh-with-praise-for-irelands-austerity-heroics-30926337.html> Accessed 15-06-15.

<http://www.bloombergvie.com/articles/2015-07-31/two-points-for-austerity-spain-and-ireland> Accessed 04-10-15.

<http://www.irishcentral.com/news/bill-gates-backs-ireland-to-bounce-back-from-austerity-programme-188816361-237561391.html> Accessed 15-06-15.

<http://www.irishexaminer.com/austerity-focus/economic-impact/is-austerity-working-yes-238955.html> Accessed 15-06-15.

⁵ <http://www.ft.com/intl/cms/s/0/328ce524-cb48-11e5-a8ef-ea66e967dd44.html> Accessed 10-03-16

argument is that this expansion in external demand, made possible by cutting relative unit labor costs, has improved the real exchange rate and kick started an *export led* recovery. Ireland is thus held up as the poster child of internal devaluation, and an example for others to “take their medicine” if they want to grow their exports, improve their current account and return to international competitiveness (Robbins and Lapsley 2014).

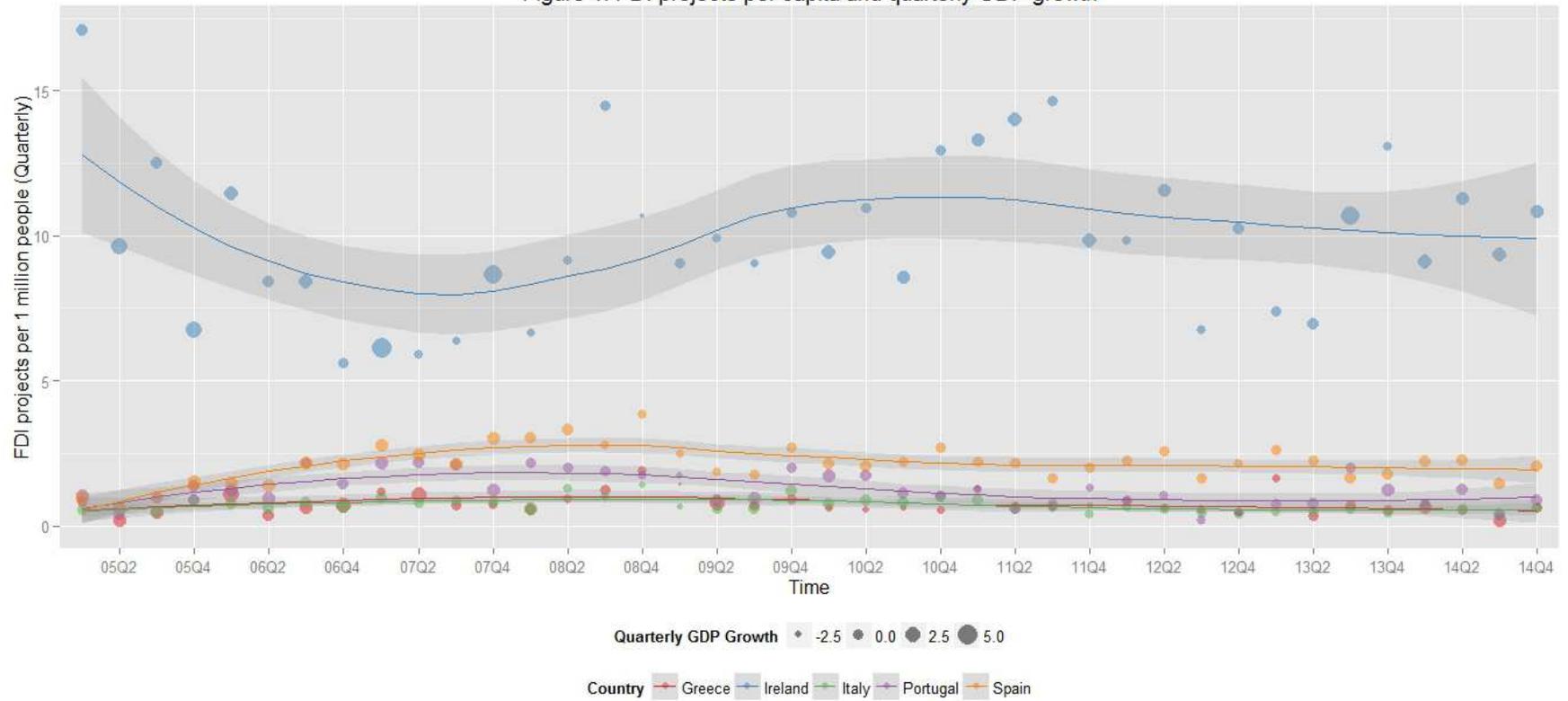
Our core claim is that the Ireland’s export growth engine has little to do with austerity-induced cost competitiveness. Rather it is the outcome of a state-led enterprise policy aimed at “picking winners” from Silicon Valley. This enterprise policy of attracting global multinationals is coordinated by *political entrepreneurs and public sector agents* in the Industrial Development Authority (IDA), and long preceded the economic crisis. Of the crisis-afflicted countries in the Eurozone, only Ireland trades in high-tech exports, as evidenced by the rapid growth of internationally traded service exports since 2008 (see figures 1 and 2). Underpinning this growth regime is the Internet-tech sector, built around global giants such as Google and Facebook, and what is colloquially referred to in Ireland as “Silicon Docks”. Ireland is now the largest exporter of computer and information services in the world (OECD 2015). The question, therefore, is how did the Irish develop the conditions for the emergence of this global Internet-tech export sector during Eurozone crisis while the other PIIGS could not? The conditions that enabled the development of this growth engine, we suggest, can be traced to the *public sector* not the market. In this regard, it is a story about the role of the state, but not quite as it is currently being told. Further, as we evidence in the case study, these tech firms were almost entirely immune to the domestic adjustment of wage cuts. Indeed, CSO (2014) data suggests that the tech sector was *increasing* wages during and the period of the Troika adjustment. All of this seriously calls into question that it was an internal devaluation that kick started Irish export growth.

In the following section we develop our theoretical argument for the role of a state-led enterprise policy in attaining the type of economic growth and recovery we have seen in Ireland. We then evidence this theoretical argument in two ways. First, we pursue a

within-case study analysis of Ireland's "Silicon Docks" to demonstrate that Ireland's export-success is due to its specific role as a US tech hub, and that the emergence of this sector is a direct result of the actions of a state agent: the Industrial Development Authority (IDA). Second, we look at an *observable implication* of this enterprise policy by conducting a quantitative analysis of foreign investment decisions in the PIIGS countries in the run up to, and during, the financial crisis. As enterprise policy is both a latent and structural variable, it is difficult to assay directly. If our core claim regarding enterprise policy (and the role of the IDA) is true than we would expect to observe an increase in investment in response to an exogenous credit shock such as the US "Quantitative Easing" (QE) program.⁶ Conversely, we would expect to see little relationship between the US QE program and post-crisis FDI in Portugal, Italy, Greece and Spain who lacked the institutional underpinnings of a developmental state-led enterprise policy. We conclude with a discussion on the implications of our analysis for the politics of austerity in Europe.

⁶ QE has been suggested to promote investment in number of ways, including through the promotion of venture capital (VC) endeavors (Ito 2009).

Figure 1: FDI projects per capita and quarterly GDP growth



Lowess-smoothed measures of FDI projects per capita with 95% confidence interval in shaded grey. Sources: fDi Markets Database, OECD, Eurostat, Authors' calculations.

RETHINKING COMPARATIVE POLITICAL ECONOMY: STATES OR MARKETS?

In line with recent developments in the comparative political economy literature (Iversen et al 2016; Hassel 2015; Hall 2014; Baccaro and Pontusson 2016; Regan 2015) we suggest comparative differences in growth regimes (consumption-led and export-led) as the fundamental explanation for the differentiated effect of austerity on the PIIGS, and their recovery from the Eurozone crisis. Where Ireland made a decades-long commitment to investment-oriented enterprise policy, as a means for attracting multilateral investment and pursuing export-led growth, the remaining PIIGS adopted significantly different growth paths, primarily built around domestic consumption. Unlike export-led growth regimes, domestic demand-led models are supported by political coalitions in the domestic non-traded sector. Within the EMU, domestic demand-driven models cluster in Southern Europe's low-productivity, mixed market economies. As noted by Brazys and Hardiman (2015) these "Club Med" countries shared a strong and direct presence of the state in the economy, with significant public bureaucracies (Sotiropoulos 2004). These structural institutional features led the respective economies to expand rapidly as government borrowing costs came down following the creation of the Euro, expanding domestic consumption. This suggests that their national growth regimes (and the underlying domestic political coalitions supporting this) are qualitatively distinct from the export sectors shaping the post-recessionary period of strong economic growth in Ireland.

Yet, simply reducing Ireland's success vis-à-vis the other PIIGS to an "export-led" vs. "consumption based" growth model is rather simplistic. The primary flaw in the new 'growth models' perspective is that it presents a too static picture of the state and underestimates the heterogeneity in both export-led and consumption-oriented economies. With respect to the former, the traditional political-economy model of export-led growth regimes is one based on international cost-competitiveness where efficiency-seeking FDI relocates to low wage locales (Rojec & Damijan, 2008). Indeed, in the European context, there was strong evidence of this driving investment decisions into Eastern Europe in the late 1990s (Bevan & Estrin, 2004). The role of the state in this type

of regime is, to a large extent, to provide strong property rights and fiscal rules but otherwise “*get out of the way*” (Blyth, 2013: 47). Divestment from industry, small (and comparatively poorly paid) public sectors, strong public finances (achieved via decreased public expenditure or increased tax) and, crucially, deregulated labor markets that keep unit labor costs low, are the stratagems of this ‘ordoliberal’ approach. Indeed, these are precisely the structural “supply side” reforms that the Troika’s austerity programs imposed in the PIIGS economies with the explicit aim of promoting export-led growth (Blyth, 2013).

More recent work, however, suggests that new forms of high-tech export growth require a much more activist role for the state (Breznitz & Ornston 2013; Ornston 2012; Mazzucato 2013; O’Riain 2004; O’Riain 2014). Mazzucato (2013), in particular, convincingly argues that *entrepreneurial* states can and do “pick winners” by actively fostering entrepreneurial growth and development. While her analysis has traction for large and well-resourced economies, such as the USA, which can afford many “failures” in waiting for a “winner”, we find it less applicable to those small and peripheral economies, lacking large internal markets. In this regard, we argue that the state can play an active role in small economies, less through entrepreneurial or developmental policy, but through what we coin as *enterprise* policy. Key to understanding enterprise policy is the recognition that the nature of export-led growth models are not static, but instead are dynamic processes based on technological innovation and flexible change. Export-led growth comes either from competing based on cost at established levels of an industry’s value-chain (see Gereffi’s (1999) classic analysis of the apparel industry as an example) or from creating and attracting the production that is at the leading technological edge of an industry. While *creating* this production is the role of an entrepreneurial policy, *attracting* this activity is the role of an enterprise policy. Importantly, enterprise policy need not capture a whole industry but instead can attract parts of a firm’s supply chain that specialize in the specific high-value activities of an industry.

Thus, an enterprise policy is an approach by the state to create the institutional conditions necessary to attract leading-edge production. However, as the leading edge of production

is dynamic, as are global industry leaders, enterprise policy is characterized by dynamism and flexibility as the institutional conditions attractive to leading-edge production are also fluid. Crucially, these efforts are coordinated by a *public sector agent* who first identify and attract industry leaders, the latter whose presence then serves to attract additional firms at the technological and productive frontier via the clustering effect (Porter 2000, Iammarino and McCann 2006). In this way, the enterprise policy becomes a virtuous circle where success begets success. Crucially, it is centered on a public sector agent with the autonomy to act independently of the electoral cycle. The public-sector agent helps these firms overcome both the search and transaction costs associated with finding the ideal institutional environment and also serves as a feedback mechanism from the firm to the state in order to update the dynamic institutional setting.

THE ENTERPRISE STATE AND INTERNATIONALLY TRADED SERVICES

Anne Wren's edited volume (2013), and recent work by Baccaro and Pontusson (2016), describes how internationally traded services, particularly in the ICT sector, are at the leading edge of high-value global production. While the traditional, cost-based, export-led growth regime that colored Europe's austerity policy may be suitable for (relatively) labor intensive, manufactured goods, it is far less relevant for export sectors of high-value services due to the nature of production and consumption of those products. Whereas manufactured goods may require comparatively low levels of skilled labor and/or vocationally specific trained labor, high-valued services necessitate a general-skilled and adaptable work force, where a premium is placed on flexibility, interpersonal and human relational capabilities. Firms engaged in internationally traded high-value services do not compete with each other for this labor on the basis of cost. On the contrary, they compete through offering their employees' lucrative sales and stock options, social insurance schemes and other favorable working conditions that have traditionally been associated

with unionized companies.⁷ Beyond a pool of a university generalist and flexible labor force, service sectors, and in particular the tech sector, benefit from a *clustering effect* of skilled labor, whether this is computational or multi-lingual (with the latter aimed at the money making part of a firm; sales and advertising). The spillovers in the tech industry are high, so the presence of a major firm in the sector will increase the likelihood of attracting other firms, particularly if the early firms are industry leaders (De Propris and Driffield, 2006). When new firms locate in an area that has established firms they can effectively recruit their workers directly from this labor market (Combes and Duranton, 2006). Thus, the cost competitiveness and structural adjustment argument underpinning the Troika's austerity policies may apply to traditional manufacturing, but not to *globally traded services*. In the latter, labor costs account for less than 10% of the total cost structure of MNC exporting firms with the implication that price-based wage competitiveness is not a determinant of their growth (Storm and Naastepad, 2015).

Beyond a flexible and skilled labor force, tax structures are also disproportionately important for high-value service exporting firms when contrasted with labor-intensive manufacturing. As noted in Doh et al. (2009: 930), the nature of service exports is ambiguous as the production, and indeed the delivery, of these exports need not "occur in the same geographic space" (Doh, Bunyaratavej, & Hahn, 2009). They are interlinked via complex global supply chains. As described by Lipsey (2010: 99) this ambiguity has allowed firms to vastly overstate their value-added in low-tax jurisdictions and that this "problem ... is probably worse for trade in services than trade in goods" (Lipsey, 2010). Thus, the tax term in the profit functions becomes relatively more important for firms that trade in high-value services both absolutely and in comparison to other determinants, including unit labor production costs. But tax is not the only determinant driving investment in high-value services export-led growth regimes. We contend that the motivation comes from *business cluster effects*, which underlines that a state-led enterprise

⁷ See Newenham (2015) <http://www.irishtimes.com/business/making-ireland-more-attractive-for-talented-overseas-workers-1.1957949>

policy aimed at coordinating and attracting export-led growth in international services is not simply a synonym for a tax haven. But it does suggest that unit capital costs (aimed at improving corporate profit margins) matters more than unit labor costs.

In an era of high-value added tradable services, the enterprise state can play a major role in both setting tax policy and building a pool of skilled and flexible labor. However, both of these policy features take time to implement in a structured and credible way. While any state can set a low corporate tax rate, building a *credible commitment* to that tax rate takes years, if not decades, where the state demonstrates its fortitude through government changes and/or times of fiscal excess and strain (Timmons, 2010). Likewise, a skilled labor force can take a generation to develop. However, while low taxes and a responsive labor market may be necessary in enticing industry-leaders in high-value traded service, these conditions are not sufficient as multiple states may, and do, offer very similar structures. To put it another way, it's not as simple as the government turning down the corporate tax dial and liberalizing the labor market and then watching FDI grow in response. A competitive tax rate and a flexible workforce may be necessary to attract FDI from global service providers but it's not sufficient in itself.

Our core claim is that the presence of an activist state agent tasked with coordinating enterprise policy is also *necessary* to attract the industry-leading, and subsequent, firm(s) in a high-growth sector. Beyond acting as a transmittal mechanism for credible institutional commitments, the public sector agent can also serve as a shepherd through the regulatory and financial transaction costs that face any firm when establishing a part of its global supply chain in a new location; activities such as sourcing office space, recruiting staff, and linking into domestic supply-chains. Thus, the role of the enterprise state in the high-value services era goes far beyond reducing costs and improving profit margins (via tax rates or labor costs). Quite the contrary, a state-led enterprise policy is built around *active coordination* of the market by a public sector agent. This autonomous public sector state agent overcomes those collective action problems facing FDI-firms in their new host market. In the coordinated manufacturing economies of northern Europe, this coordination

occurs through sophisticated employer and trade union associations. In the world of internationally traded services, it requires a much more direct role for the public sector. Hence our core claim is that the conditions for developing a high-tech export growth engine begin with the state not the market. It is this central coordinating role for the *public sector* in facilitating the expansion of the competitive sector that studies of comparative capitalism miss.

IRELAND: AN ENTERPRISE STATE BUILDS THE SILICON DOCKS

To evidence that it was enterprise policy, rather than austerity, that drove Ireland's divergent recovery in the post-crisis era we now turn to a within-case study of Ireland's "Silicon Docks". The case study traces the origins of Ireland's high-tech sectors in information and computer services to the role of the public sector agent, the IDA, and their relationship with Google and other global multi-national corporations. The strategy of the IDA is straightforward: get an emergent global industry leader to locate their European headquarters in Ireland, and then bank on the cluster effect that their presence will create, thereby building a high-tech export sector that is at the leading edge of technological change and global market expansion.

The descriptive statistics surrounding Ireland's recovery leaves little doubt as to what sectors drove growth in a period of contracting domestic demand. Exports accounted for 113 per cent of Irish GDP in 2015, and almost 90 per cent of this comes from the foreign owned global US multinationals⁸. Figure 2 shows the extent of the Irish recovery in exports vis-à-vis the other crisis afflicted countries of the Eurozone, a recovery that was driven by *internationally traded business services*: internet-tech, biotech, e-commerce and marketing. In 2014 international services accounted for 55 per cent of Irish exports and ICT computer services count for over 50% of this growth, whilst total Irish trade in services is over 100

⁸ See Irish Business and Employers Confederation http://ibec.ie/Sectors/ICT/ICT.nsf/vPages/Papers_and_Sector_Data~sector-profile?OpenDocument
Accessed 20-08-2015

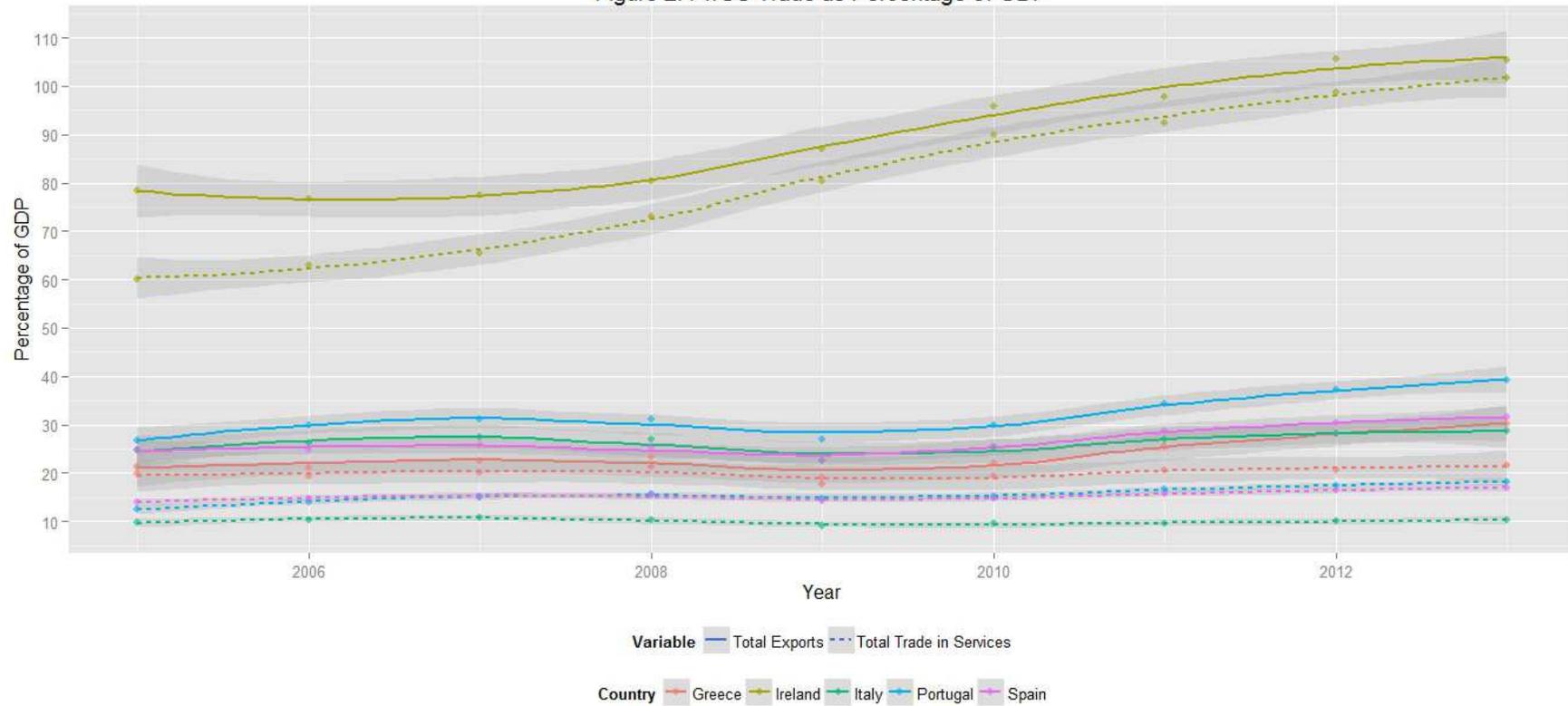
per cent of GDP.⁹ Of note is that exports were on already on the rise in Ireland *before* the 2008-2009 crises. This services export recovery was primarily shaped by the presence and expansion of US MNCs in the Internet tech and computer services sector: Google, Apple, Microsoft and Facebook. Total service exports account for approximately €90 billion of Irish exports and these global tech firms now account for around €40 billion of this.¹⁰ In 2015 Ireland, with a population of just over 4.5 million people, was the largest exporter of computer and information services in the world (OECD 2015).

In contrast, the other PIIGS countries, whose trade portfolios are more dominated by *traditional manufactured goods*, saw significant downturns in exports in 2009 as global demand fell. This divergence can be traced to the ‘imbalance of capitalisms’ within the Eurozone: consumption-oriented and export-oriented growth regimes. The divergence between these growth regimes can be simply observed by examining the share of exports as a percentage share of national income among the PIIGS countries. Exports have only ever accounted for between 20-28 percent of GDP in Portugal and Greece, and between 25-32 percent in Spain and Italy, whereas they exceed 100 percent in Ireland. More importantly for the argument being developed here, the production structure and trade portfolio of the US firms that underpin Irelands export growth engine are geared toward high-productivity and high-wage activities. It is our argument that this export-growth regime is the direct outcome of decades long activist state-led enterprise policy.

⁹ The overall main driver of Irish export growth, however, is the pharmaceutical sector (see Barry & Bergin 2012),

¹⁰ http://www.finfacts.ie/irishfinancenews/article_1027837.shtml Accessed 06-06-15

Figure 2: PIIGS Trade as Percentage of GDP



Lowess-smoothed measures of Total Exports and Total Trade in Services with 95% confidence interval in shaded grey. Source: World Bank, World Development Indicators, Authors' calculations.

Process Tracing: Irish Enterprise Policy over the Decades

In the Irish case the role of enterprise policy in developing high-tech industries, or innovation clusters, is a decades-long story that has occurred in three distinct waves (see Worrall 2015a, 2015b). Each wave begins with the IDA luring a large global US firm to set up their leading-edge operations in Ireland via corporate tax incentives and a liberal labor market regulatory environment. This focus on corporate taxation is well documented in the critical political economy literature but what is less analyzed is how the presence of a global firm in each wave subsequently generates a clustering labor market effect for additional FDI from firms trading in the same sector. It is investment from these global industry-leaders that the IDA chases.¹¹

ICT Manufacturing – the First Wave

The first wave started in 1989 when the IDA secured inward investment from INTEL to establish their European micro-processing plant in Ireland (White 2000a). At the time, micro-processing manufacturing was a high-value, high-skilled product at the leading edge of the ICT industry. The IDA helped overcome the transaction costs associated with establishing production by sourcing the location for INTEL's proposed plant and actively recruiting 300 skilled engineers from California, and elsewhere, to return to Ireland to work for the company (White 2000a, confirmed in interview with IDA board executive). INTEL's presence as an industry leader quickly attracted other leading-edge firms in the same sector. IBM, Apple, Dell and other manufacturers either established or expanded their operations during this emergent period. Employment in the sector doubled during the 1990s with Apple and INTEL each employing over 4,000 people by 2014 (Newenham 2015; MacSharry et al 2000).

¹¹ Annual reports on FDI from IDA supported firms can be found here: <http://www.idaireland.com/about-ida/annual-reports/> and the IDA's take on its own history here: <http://www.idaireland.com/about-ida/history/>

Software Development – The Second Wave

However, as computer manufacturing became commoditized during the mid-1990s many ICT firms began to move their hardware manufacturing operations outside Ireland to low-wage, low-cost economies, particularly in Eastern Europe. Rather than attempt to convince these firms to keep these now comparatively low-value activities in Ireland, the IDA shifted strategies to target software companies (see White 2000b and 2000c). This led to the second wave of inward investment from ICT companies in the software sector (Worrall 2015). By the early 2000s Ireland was the second largest exporter of software in the world, which was now at the forefront of high-value production in ICT (Barry and Egeraat 2008). This second wave of investment primarily came from *existing* IDA client firms, particularly Microsoft and Apple. A core strategy of the IDA is to maintain a close relationship with the senior executives of their client firms after they establish their operations. The purpose of this is to monitor change and to be prepared to assist and facilitate the transformation of their business model. A large part of their role is to get corporate information and then feed this back to the state institutional structure when the needs of the firm change, particularly if job retention becomes an issue. For example, IBM employed 4,000 workers in manufacturing in Ireland in the early 2000's. In 2015, they continued to employ 4,000 people, but *none of who* worked in manufacturing¹².

During this second wave of investment the IDA also began to target Silicon Valley, luring emergent Californian based software companies such as Oracle, AOL and one of the world's first Internet browsers, Netscape (Newenham 2015). While most of these firms were ultimately unsuccessful, and many shut down their business, they contributed to the cluster of experienced workers and, in particular, a new generation of Irish managers with US corporate experience in the tech sector. In addition, some of the investment during this period led to the construction of data analytic centers, which went unused for a decade. But

¹² See <http://www.amcham.ie/news/latest-investments/ibm-ireland-a-60-year-journey.aspx> accessed 10-03-2016. Figures confirmed from interview with IDA.

this would subsequently prove to be a crucial incentive to attract Internet technology firms, who require high-levels of data sensitivity (interviewee 2/3). At the end of this second wave of ICT investment, State agents had secured the long-term investment of three global leaders: INTEL, Apple, and Microsoft, all of whom became central to Irish export growth, and none of whom would have invested in Ireland in the absence of an activist state enterprise policy (Monaghan et al 2014).

The Google effect – the Third Wave

The dot-com crash in the early 2000s negatively affected IT investment into Ireland (and is one of the factors that encouraged government to expand domestic consumption via tax cuts to maintain employment growth during the early years of EMU). But the tech sector took off again from 2004 with the arrival of new “born on the internet” companies from Silicon Valley¹³ (Burke 2015). It is this third wave of Internet technology related FDI, associated with an influx of investment from information and computer services companies, which is central to explaining Ireland’s economic recovery from 2009 onwards.

The critical juncture can be traced to industry-leader Google’s decision to establish their European HQ in Dublin in 2004, which was followed by Facebook in 2008.¹⁴ This “*Google Effect*” was equivalent to the earlier “INTEL effect” in that it effectively launched a new technology sector in Ireland (interviewee 2). Google employed less than 50 employees when they established their operations in 2003.¹⁵ From 2004-2014 they expanded and currently employ around 4,000 employees directly, and almost 5,000 employees indirectly,

¹³ For detailed press releases on internet firms investing in Ireland, see IDA press releases for the digital sector here: <http://www.idaireland.com/business-in-ireland/industry-sectors/internet/> accessed 10-03-16

¹⁴ See <http://www.irishtimes.com/business/technology/a-seismic-shift-for-dublin-how-google-was-persuaded-to-set-up-shop-in-ireland-1.2074137> accessed 10-03-16

¹⁵ See IDA case study on Google Ireland: <http://www.idaireland.com/how-we-help/case-studies/google/> accessed 10-03-16

with the latter on short-term contracts.¹⁶ Facebook followed in 2008. They initially worked out of a Dublin-based IDA office with 70 employees, but by 2015 they employed 2,000 workers. By 2016, Ireland hosted *nine out of ten* of the top global US technology firms, employing 24,000 people and generating €16bn in annual exports¹⁷. The IDA strategy was to focus on attracting the high-value services components of these firms' operations. In the high-tech Internet firms that now operate in Ireland, most of the focus was put on establishing marketing and sales.¹⁸

The arrival of Google was a direct outcome of a five-year campaign by the IDA to secure their investment, ahead of Switzerland (interviewees 5-9). Based on the IDA's previous experience of luring INTEL, the IDA's strategy was aimed at ensuring Google established a data analytic center, which would sink their costs and embed their presence in the economy. The IDA strategy was based on the assumption that if Google established their European HQ in Dublin it would facilitate a new wave of additional investment from a whole host of companies in receipt of venture tech capital funding, seeking to cluster around the Internet giant. The political objective, therefore, was to focus all resources on Google in expectation that their presence would attract investment from all those firms in Silicon Valley seeking to grow their European markets.

This has proven to be correct. During the period of Europe's austerity agenda (2009-2014) the following global Internet companies have set up operations in Ireland: Zynga, Twitter, DropBox, LinkedIn, Hubspot, Trip Advisor, AirBnB, Square Space, Sales-force and Engine Yard, to name but a few. We have identified an additional 80 companies that have invested in Ireland during this same time period, listed in Appendix V¹⁹. Within the space of ten

¹⁶ See Silicon Republic webpage for more information: <https://www.siliconrepublic.com/careers/2015/05/13/record-number-of-jobs-available-ireland> accessed 10-03-16

¹⁷ See <http://www.idaireland.com/business-in-ireland/industry-sectors/software/> accessed 10-03-16

¹⁸ It is often wrongly assumed that these jobs are 'low skilled' because they don't require technical skills. But they are the core money-making part of the firm and therefore a premium is put on interpersonal and general communication skills.

¹⁹ For an exhaustive list see: <http://makeitnireland.com/tech-map/>

years, and despite comparatively high labor costs, *public sector agents* tasked with developing Ireland's export engine crafted the conditions to turn Dublin into a European tech hub. If the State had not secured the investment of Google and Facebook, this cluster effect is not likely to have occurred.

While all of the Internet technology firms want a competitive tax rate, an equally important attraction is the human capital externalities that emerge from thick labor markets and business innovation clusters. The global presence of Google, Amazon and Facebook has created a large internal labor market in the tech sector. These firms require multi-lingual proficiency and although this locks-out many Irish graduates from the perspective of these firms, this does not matter as long as they have access to the labor supply of the twenty-eight member states of the European Union. Research gathered from the interviews for this project suggests that corporates put a significant premium on the multi-cultural dynamic that comes from a multi-linguistic workforce. Cultivating this labor pool over decades is a key component of the state enterprise policy. Highlighting the beneficial effects of the most flexible labor market in the Eurozone, aimed at 28 EU member-states, rather than selling the cost effect of cheap labor, is a crucial part of the IDA's strategy to attract Silicon Valley firms (interview with IDA executive).

The computer and information services sector was almost entirely immune to the internal adjustment and compression in domestic demand associated with the Troika austerity program. Unit labor costs in Ireland have been reduced, and the real exchange rate improved, but this is primarily because of a contraction in the labor intensive and non-traded domestic sectors of the economy, primarily construction (McDonnell & O'Farrell 2015). According to a senior corporate executive interviewed for this project, "*the only time we experienced austerity was when we walked through the streets after leaving the office*". Crucially, CSO (2014) job churn data shows that the information and computer services sector, in addition to the financial services sector, were the only parts of the economy that experienced *increased* wages during the period of the Troika adjustment, while public sector wages were cut, on average, by 14%. Simply put, cutting wages via austerity had

nothing to do with attracting the firms that led Ireland's recovery. On the contrary, the average salary for an IDA assisted firm is 47k per annum.

To recap, our core claim is that the expansion of investment into the US-Irish tech sector from 2009 onwards was a direct outcome of a state-led enterprise policy to attract the frontier of high-value production. Our core argument is that this investment has fueled the Irish recovery, *not* austerity-induced competitiveness. Timing, in this regard, is crucial (in the vein of Paul Pierson's 2004 analysis of path dependency). The fact that two Internet global giants, Google and Facebook, were already based in Dublin *prior to the crash*, and had a hugely expansive workforce, meant that the IDA was well placed to steer additional ICT investment into Ireland during the period of economic adjustment. To give a qualitative sense of what the IDA were doing during this specific period (whereby Ireland's reputation had been shot due to the financial market moniker PIIGS), the IDA dedicated almost three quarters of their annual budget to marketing, and launched a massive business advertising campaign in the USA. This strategy was specifically targeted at technology investors and included slogans such as "*Facebook found a place for people who think a certain way: it is called Ireland*", and "*Google searched the planet for a place to do business: they choose Ireland*" (cited in Newenham 2015, p57). Whilst it is tempting to dismiss these 'soft strategies' as irrelevant they clearly show that the IDA was using the presence of global tech firms to lure other Silicon Valley based firms, in receipt of venture capital funding, to expand their European operations and invest in Ireland.²⁰

The enterprise state is tasked with developing a high-tech export-sector, and specifically attempts to build a cluster of firms trading in similar global markets. This state-led FDI growth model is fundamentally absent in the other PIIGS economies, with the exception, perhaps, of Catalonia. Their failure to mirror Ireland's recovery comes not from failing to implement austerity policies, but instead from the fact that their growth model was not

²⁰ If there was an improvement in cost competitiveness during this period it was related to cheaper commercial property, a trend that has since gone into reverse in Dublin.

conducive to the high-tech export-led strategy of the Irish state. This is not, however, a normative celebration of Ireland's developmental export model. One of the biggest tradeoffs in prioritizing FDI is a lack of priority accorded to the indigenous enterprise sectors. The latter has certainly benefited from the cluster effect of these global firms, evidenced by the fact that ICT and information and computer services recorded the largest net growth in employment of Irish-based exporters in 2013 and 2014 (an increase of 2,092 jobs).²¹ But US-exporters continue to count for 90% of all exports from Ireland. Furthermore, the ability of global tech firms to use Ireland as an avenue to re-direct their taxes to Bermuda, and thereby engage in active tax avoidance, clearly poses deep distributional problems that are beyond the scope of this paper. But it is worth noting that this "tax competition" strategy is not likely to be sustainable in the context of increasing European integration, as evidenced by recent interventions by the European Commission on Apple and Google's Irish tax affairs.

We contend that the within-case process tracing analysis above provides convincing evidence that a decades-long *enterprise policy* in Ireland, rather than austerity measures, account for Ireland's success in attracting the high-tech export firms that have driven the Irish recovery. However, since the facets of Irish enterprise policy are largely structural, and therefore mostly time-invariant, it is difficult to conduct a *direct* comparative assessment if this alternative growth model is responsible for attracting investment to Ireland vis-à-vis its PIIGS neighbors. Instead, in the next section, we look at an *observable empirical implication* of enterprise policy – namely that a state with an enterprise policy should be comparatively better positioned to attract inward investment when the global financial system is hit with a positive credit shock.

²¹ See <https://www.enterprise-ireland.com/en/Publications/Reports-Published-Strategies/2014-Annual-Report-and-Accounts-English.pdf>

DIVERGENT RECOVERY IN THE PIIGS: FOLLOW THE MONEY

The case study analysis above demonstrates how the Irish economy was differentially situated from its peers on the European periphery, and deeply problematizes the assumption that export-growth in high-value services was a causal outcome of austerity induced cost competitiveness. This recognition forms the basis of our expectation for why Ireland has experienced such a dramatic divergence in its recovery from the 2008 financial crisis vis-à-vis its contemporaries. Due to its decades-long, state-directed enterprise policy, Ireland was well primed to receive inflows of FDI, which facilitated its export-led recovery in information and computer services. The other PIIGS countries, which did not have an activist state seeking to build high-tech export growth, but instead relied on an economic model driven, to a large extent, by publically financed domestic consumption, have been unable to recover due to the continued constraints their governments face in securing external finance within the austere constraints of EMU.

In order to test for an *observable implication* of enterprise policy, we consider the relationship between FDI project announcements and an “exogenous” credit shock, the US Quantitative Easing (QE) program, through a comparative analysis of the PIIGS. Our contention is that different growth regimes, shaped by varying levels of state-led developmental and enterprise policies among the PIIGS, *not* austerity-induced wage competitiveness, make the constituent states more or less attractive as FDI destinations. This is particularly the case in Ireland, where the IDA is specifically tasked with winning FDI and their performance measured against the number of FDI projects and jobs they can announce. The impact of QE on increased FDI flows and other macroeconomic outcomes has been well documented in a number of recent papers (Cho and Ree, 2014; Lim et al., 2014; Park et al., 2014; Schwartz, 2015). The relationship occurs through the three traditional “transmission channels” of liquidity, portfolio balancing, and confidence, which essentially related to the price of finance (Lim et al., 2014: 2). By expanding the money supply, QE reduced financing costs for firms looking to invest (at home or abroad) in *any* market that promised sufficient return. If Irish enterprise policy was working as we

contend, then the return in investment in Ireland came *not* from austerity-induced wage competitiveness, but from the enterprise policy coordinated by the public sector agent the IDA. In this instance, Ireland will have seen a larger increase in the number of FDI projects in response to QE vis-à-vis the other PIIGS. These logics lead us to three testable hypotheses.

Hypothesis 1: The US QE program increased FDI projects to Ireland due to the presence of enterprise policy.

Hypothesis 2: Austerity-induced wage competitiveness did not result in increased FDI projects to Ireland.

Hypothesis 3: The US QE program led to more FDI projects in Ireland compared to Portugal, Italy, Greece or Spain due to the presence of enterprise policy not wage competitiveness

Our investigation focuses on the US Federal Reserve's Treasuries Holdings, QE_{Δ} , which were expanded markedly under the QE programs, as the main independent variable.²² This approach allows for a direct measure of the magnitude of the QE impact, by providing an amount of monthly QE, rather than a simple temporal indicator as in (Park, Arief, & Shin, 2014), and also allows for observations on a monthly frequency. This is a significant advantage as we are explicitly trying to determine the (differential) timing of the PIIGS into and out of crisis. Differences that are observable in monthly data may be obscured when aggregating to longer time periods.

²² And in particular the 2nd and 3rd QE programs. The first QE program saw the US Federal Reserve focus on buying mortgage-backed securities, in particular subprime collateralized debt obligations (CDOs) from distressed financial institutions. We think that the causal logic for the 1st QE program translating into increased FDI is significantly weaker than that of the 2nd and 3rd, and indeed the studies cited above show a more substantial impact from these latter programs. Accordingly, we focus our empirical investigation on the 2nd and 3rd QE rounds.

We focus our dependent variable on the number of *FDI projects* rather than the amount of FDI as a component of Gross Financial Inflows (GFI). There are two advantages to this approach. Utilizing proprietary data from the Financial Times fDi markets database, we employ an actual count of monthly FDI projects into the five PIIGS countries.²³ As a verified count, this metric is less susceptible to measurement error and temporal smoothing vis-à-vis the statistical estimates that are employed to generate FDI inflow data.²⁴ Beyond reducing our concerns with measurement error, this indicator also provides data with a monthly frequency, allowing for more fine-grained temporal identification of the QE effect, and its relationship to enterprise policy.

Our dependent variable data consists of a panel of the monthly FDI Projects announcements in each of the PIIGS countries from January 2003 to December 2014. As this measure is a left-censored count variable we employ negative binomial regression.²⁵ Wooldridge tests suggest the presence of autocorrelation in our data so we also run generalized linear models where we specify generalized linear model with a negative binomial distribution for the dependent variable.²⁶ These results are available in Appendix II and are substantively similar to those presented in Table 1 below.

In the first instance (Model I), we run a baseline, non-panel model, which simply considers data from the Irish case in order to consider hypothesis one: the relationship between QE and Irish FDI announcements. We then add (Model II) a measure of the rate of change of

²³ This data counts both “Greenfield” and expansion FDI projects.

²⁴ The Financial Ties fDi data does not include actual investment amounts for all documented projects. However, for those projects that did have investment amounts the average per-project amount for each individual PIIGS country was well within one standard deviation of the average per-project amount for all the PIIGS countries. This leads us to believe that the verified *number* of projects is also a reasonable proxy for the *amount* of FDI.

²⁵ Post-estimations tests from a Poisson regression suggest the data is over-dispersed and as such we use negative binomial (xtnbreg in Stata 13). Dickey-Fuller tests reject the null hypothesis of non-stationarity for our main variables of interest, the number of FDI projects and the *first-difference* in Treasury holdings, at the 0.01 level.

²⁶ Where a Wooldridge test on all variables in Model IV returns a test statistic $F(1,4) = 8.027$, $\text{Prob} > F = 0.0472$. Generalized Linear Models in Appendix II use the Stata 13 command `glm, family(nb) vce(robust)`.

wages, *Wages_4*, in Ireland in order to evaluate hypothesis two.²⁷ If our contention is correct that it is pull effect of a state-led enterprise policy, rather than austerity-induced wage competitiveness (internal devaluation), that attracts FDI, then we would expect to see no statistically significant relationship between this measure and the number of FDI projects. Finally, to test hypothesis three, how QE impacted FDI vis-à-vis Ireland and the remaining PIIGS, we use a technique similar to that employed in Berthélemy and Tichit (2004). We first run an aggregate random-effects panel model investigating the overall effect of QE on FDI announcements in the PIIGS countries (Model III).²⁸ We then look for parameter differences for Ireland by estimating the full model again with the addition of all of the explanatory variables multiplied by an *Ireland* dummy variable (Model IV). This technique also allows us to assess the impact of the explanatory variables on Irish FDI projects compared to the other PIIGS countries.

We incorporate a number of control variables from Lim, et al. (2014).²⁹ We expect larger economies, *GDP*, to have more FDI projects. Likewise, higher *GDP Growth* rates and higher *Risk* premiums on corporate bonds increase the attractiveness of FDI Projects and should increase FDI Projects numbers.³⁰ Based on findings from Brazys & Hardiman (2015) that increased media usage of the PIIGS term caused financial markets to treat those countries more similarly, we include their count variable of *PIIGS* usage, expecting a negative correlation with FDI Projects. Finally, we also include the monthly average of the *USD/EUR* exchange rate, expecting a higher number of FDI Projects announcements when the Dollar is strong. Data sources and summary statistics are available in Appendix I.

²⁷ Where our measure is the monthly first-difference in the average of the NACE “m” (professional, scientific and technical activities) and “j” (information and communication) wage codes.

²⁸ We use a random-effects model as a Hausman test fails to reject the null, although our results below are robust to country-level fixed effects, results which are not presented but available upon request from the authors.

²⁹ We lag all control variables by one period (month or quarter) to account for the delay in firms processing economic information and making FDI decisions. We do not lag the difference in Fed Treasury holdings as the timing of these bond buying programs were well publicized thus presumably known to firm decision makers. We lag these differences as a robustness check (results available from authors upon request) and find no difference in our substantive findings.

³⁰ Where we use a standard measure for risk premiums, the spread between Baa corporate bonds and the 10-year constant maturity US Treasury.

Table 1: FDI Projects and QE (Negative Binomial Regression)

Variable	Model I (Ireland)	Model II (Ireland with wages)	Model III (PIIGS)	Model IV (PIIGS / Ireland Comparison)
QE_Δ	0.0022** (2.85)	0.0022** (2.83)	-0.0000 (0.02)	-0.0007 (1.30)
PIIGS	0.0005 (1.10)	0.0006 (1.27)	-0.0002 (0.94)	-0.0005 (1.59)
GDP	-0.0224* (1.96)	-0.0224* (1.96)	0.0019** (2.87)	0.0030** (4.53)
GDP Growth	0.0101 (1.23)	0.0121 (1.44)	-0.0021 (0.66)	0.0082** (2.79)
RISK	0.0412 (1.03)	0.0366 (0.93)	0.0491* (2.45)	0.0520* (2.34)
USD/EUR	1.4032** (3.40)	1.3967** (3.38)	1.0371** (5.41)	0.8250** (4.07)
Wages_Δ		-0.0015 (0.95)		
QE_Δ*Ireland				0.0031** (3.18)
PIIGS*Ireland				0.0010† (1.90)
GDP*Ireland				-0.0145 (1.28)
GDP Growth*Ireland				0.0109 (1.24)
RISK*Ireland				0.0049 (0.10)
USD/EUR*Ireland				1.0088** (2.53)
Constant	1.5757** (2.80)	1.6117** (2.87)	0.3027 (1.14)	0.2502 (0.93)
N	138	138	676	676
χ ²	29.66	30.91	65.33	111.18
Prob > χ ²	0.0000	0.0000	0.0000	0.0000

Absolute value of z score in parentheses. ** Significant at 1% level, * Significant at 5% level, † Significant at 10% level.

The findings in Table 1 provide substantial support for our hypotheses. Examining the Irish data alone, to evaluate hypothesis one, we see a positive and statistically significant relationship between changes in QE and the number of FDI projects in Ireland. Negative binomial regression reports the change in the expected log count of the dependent variable for a one-unit change in the independent variable. Accordingly, an increase of one-billion dollars in the monthly change of Treasuries held by the Federal Reserve is associated with an increase of 0.0022 in the log count of Irish FDI projects. The Federal Reserve increased its Treasury holdings by over 2 trillion dollars over the duration of QE, suggesting an

additional 81 FDI projects in Ireland over the same time period, *ceteris paribus*. This result is magnified considerably in the panel comparison model (IV) where the coefficient for changes in QE on FDI projects for Ireland is positively and significantly different from the remaining PIIGS, suggesting that *over the life of the program, QE contributed to 300 more FDI projects in Ireland vis-à-vis the other PIIGS, ceteris paribus*. We take these findings as significant evidence supporting hypothesis three, - that as a result of the *business cluster*, shaped by the presence of enterprise policy in Ireland, and the lack of in the other PIIGS, the US QE program had a profound and differential impact on the number of FDI projects in Ireland compared to the remaining PIIGS countries. Likewise, the results in Model II support our contention in hypothesis two that it was the state-led enterprise policy (*vis-à-vis* QE) and *not* the austerity-induced changes in Wages that led to increased FDI projects in Ireland, as the coefficient on that variable is insignificant.³¹

The results on the control variables increase our overall confidence in the model. The USD/EUR exchange rate is statistically significant in the expected direction in all models. While GDP, the GDP growth rate, and the Risk measure are insignificant in the Ireland-only model, GDP and the Risk measure are both significant in the expected direction in the aggregate model. We think the non-findings on these controls in the Irish model are entirely consistent with our empirical puzzle and theoretical explanation – Ireland was categorized as one of the PIIGS countries in crisis (as evidenced by high bond yields and a shrinking economy) and yet attracted a large number of FDI projects that led to its recovery. Clearly the “conventional wisdom” on FDI determinants did *not* hold in Ireland but, rather, something else (the innovation cluster of Ireland’s state-led enterprise policy) attracted FDI to Ireland. On the one hand, this is related to low corporate taxes but, on the other, as demonstrated in the case study above, it is the consequence of a *cluster effect* associated with an expanding innovative sector, led by the enterprise state.

³¹ This non-finding is robust to a number of different formulations of the change in wage variable as shown in Appendix III. We also found no significant bivariate relationship between wages and the number of FDI projects or between wages and QE.

The sole anomalous results from the controls is the evidence that use of the PIIGS term had a *positive* impact of FDI projects into Ireland compared to, if anything, the expected negative impact, on the remaining PIIGS countries. Our initial reaction to this finding is that it points to the different cognitions in the logics driving short term “portfolio” investment, where fortunes can be won and lost in seconds (Easley, Lopez de Prado and O'Hara 2011) compared to the widely-understood long-term planning and decision making behind FDI (Popper, Perez-Quiros and Chuhan 1996). Whereas the former (financial markets) might be more vulnerable to heuristics and mental short cuts in decision-making, the latter (FDI investors) are likely to be based on a more considered analysis that is less easily swayed by herd behavior.

In sum, our statistical findings show a strong relationship between the US QE program and increased levels of FDI projects in Ireland vis-à-vis its PIIGS counterparts. Further, we find no evidence that lower wages induced by austerity led to more FDI projects. The logic behind this result is that, like elsewhere in the world, QE reduced financing costs and increased the relative return on non-paper assets, prompting investors to seek out return elsewhere. Our argument is that Ireland was the beneficiary of this search *not* because it ardently followed austerity policies to increase its market competitiveness but because the state built the institutions via an enterprise policy to attract this investment – a policy that was not diminished, and perhaps enhanced, by the 2008 financial crisis. The other PIIGS failed as beacons for FDI not because they lacked austerity-driven competitiveness (they did not) but because they had not invested sufficiently in a developmental enterprise policy aimed at building high-tech export growth.

DISCUSSION

Austerity in Europe is premised on the manufacturing model of cost competitiveness whereby a reduction in relative unit labor costs is assumed to correlate with an expansion of net exports. In the EMU, where countries cannot improve competitiveness via their external exchange rate, this internal devaluation has become a core part of the prescribed

adjustment facing crisis-afflicted countries. Ireland's economic recovery continues to be regularly cited as a successful example of this, despite mounting evidence that reducing unit labor costs has had no positive impact on export growth in the other four PIIGS countries (Storm and Naastepad, 2015). Our analysis further shows that this policy prescription is fundamentally misplaced. Ireland's recovery had little, if anything, to do with austerity induced cost-competitiveness. Rather it has everything to do with a state-led enterprise policy aimed at "picking winners" from Silicon Valley and the cluster effect of high-tech export growth in internationally traded services. In this regard, Ireland is a crucial case. But not for the reasons the European narrative suggests. It is a crucial case for examining the *role of the state* in building export-growth regimes in peripheral market economies, not for the success of austerity-induced cost competitiveness.

Ireland's high-wage, high-productivity, internationally traded ICT services are relatively price insensitive, particularly to labor costs, and compete in international markets that do not look like the traditional manufacturing model underpinning the design of the Troika macroeconomic adjustment. It is important, therefore, to call the Irish recovery what it is: a state-led enterprise policy, coordinated by an autonomous public sector agent, specifically tasked (and adequately resourced) to attract investment from global firms in an internationally liberalized market. This deeply embedded and path dependent 'enterprise state' is not easily replicable, and demand-led political economies in southern Europe are just as unlikely to converge with the Irish export-growth model in information and computer services, as with the German manufacturing model. Any country can cut its corporate tax rate and liberalize the labor market. But it takes decades to build a successful enterprise policy, and the conditions for high-tech *business clusters*.

On the one hand, our study supports the core hypothesis of the classic varieties of capitalism theory, namely that liberal market economies are better placed to develop comparative advantage in high-risk innovative tech sectors, given the highly flexible nature of their labor markets, and a focus on general university education, as opposed to skill-specific vocational training. It is therefore unsurprising that a core component of the Troika

adjustment is the attempt to liberalize product and labor markets through supply-side structural reforms in the rest of the PIIGS countries. But what the supply-side structural reform agenda in Europe ignores is the dynamic role of the state in creating or capturing cutting-edge growth. Lower corporate taxes and the liberalization of labor markets in peripheral Euro economies are not likely to generate the conditions for high-tech export-led growth in the absence of developmental activist state. Our research shows that Ireland's export growth regime, and its capacity to attract FDI in liquid US markets after the QE program, can be traced to the public sector, rather than market liberalization. Further, it shows that when a public sector agent is autonomous from government and empowered to develop high-tech industries, it does not necessarily imply clientelistic rent seeking (even if some argue that the IDA has been captured by the interests of the FDI sectors).

We need new words to describe what the state does. In particular, we need new words to describe the role of the state in facilitating the development of leading edge industry production in a world of complex global supply chains. In most political economy models, the firm is assumed to be a manufacturer, which has significant implications for considering the importance of wage competitiveness, and labor politics more broadly. But in most advanced economies today, manufacturing makes up less than 15% of total employment. It is a declining sector yet the language and concepts we use in comparative and international political economy continues to assume it is the core export growth engine of advanced economies. The reality today, however, is that the expanding sector is in services: traded and non-traded (Wren 2013, Ansell & Gingrich 2013). In this regard, our research complements those studies that seek to 'rethink comparative political economy' through focusing on the comparative capitalist differences in macroeconomic growth regimes (Baccaro and Pontusson 2016). However, "rethinking comparative political economy", we suggest, necessitates rethinking the role state. The theoretical inference to be drawn from over study is that it is variation in the organization of the state, and those public sector agents tasked with attracting FDI, which explains the variation in high-tech growth among countries. Hence, the extent to which the other crisis afflicted countries in "Club Med" can carve out an autonomous growth regime through a state-led enterprise

policy aimed at export-led growth, without falling prey to regulatory capture, seems to us to be a crucial and underexplored part of the debate in international and comparative political economy today.

To conclude, austerity-induced cost competitiveness had little, if any, direct effect on Ireland's export-led recovery from the Eurozone crisis, and this is perhaps the most important policy implication of our research. This is not a normative endorsement of the Irish model. Rather it is a theoretical and empirical study that suggests the conditions for export-led growth in peripheral economies are the outcome an embedded relationship between the *public sector* and large foreign owned global tech firms. This deeply embedded role for the state in the international market underpins the capacity for small countries to make the transition to export-led growth in internationally traded services, rather than austerity, declining labor costs or macroeconomic stabilization. It is, fundamentally, about strategic political decision-making, and economic coordination rather than market competition. If the European Commission is serious about generating the conditions for economic and employment growth in the Euro area it needs to rethink the German ordoliberal consensus on austerity. It needs a state-led enterprise policy.

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Appendix I: Data sources and summary statistics

Table I.1 Data Sources and Summary Statistics

Variable	Source	Mean (SD)	Min	Max	N=
FDI Projects	Financial Times fDi Intelligence Database http://www.fdiintelligence.com/ (Number of projects per month)	13.49 (11.98)	1	68	705
QE	http://research.stlouisfed.org/fred2 (Monthly holdings in billions of current USD)	1092.31 (597.90)	474.68	2500.00	720
PIIGS	Brazys and Hardiman 2015 (Number per month)	34.60 (68.93)	0	447	720
GDP	http://data.worldbank.org/data-catalog/world-development-indicators (Quarterly, billions of current USD)	156.52 (143.53)	34.64	430.82	720
GDP Growth	http://data.worldbank.org/data-catalog/world-development-indicators (Authors' calculations, quarterly)	0.72 (5.94)	-14.31	12.24	705
RISK	http://research.stlouisfed.org/fred2 (Spread between Moody's Seasoned Baa Corporate Bond and 10-year Treasury Constant Maturity)	2.65 (0.87)	1.56	6.01	720
USD/EUR	http://stats.oecd.org/ (Monthly average, USD per Euro)	1.31 (0.10)	1.06	1.58	720
Wages_Δ	http://www.cso.ie (Change in monthly average of wages NACE codes M and J in current Euros).	2.40 (20.69)	-53.66	53.12	141

Appendix II: FDI Projects and QE (Generalized Linear Models with Robust Standard Errors)

Variable	Model I (Ireland)	Model II (Ireland with wages)	Model III (PIIGS)	Model IV (PIIGS / Ireland Comparison)
QE_Δ	0.0022** (2.90)	0.0022** (2.82)	0.0005 (0.63)	-0.0006 (0.62)
PIIGS	0.0005 (0.76)	0.0006 (0.87)	-0.0001 (0.24)	-0.0006 (1.17)
GDP	-0.0224† (1.66)	-0.0237† (1.67)	0.0032** (13.77)	0.0052** (18.63)
GDP Growth	0.0129 (1.33)	0.0150 (1.52)	-0.0004 (0.06)	0.0089† (1.70)
RISK	0.0402 (1.41)	0.0371 (1.29)	0.0470 (1.43)	0.0562 (1.51)
USD/EUR	1.3525** (3.50)	1.3524** (3.48)	0.9256** (3.00)	0.4896 (1.61)
Wages_Δ		-0.0017 (1.18)		
QE_Δ*Ireland				0.0028* (2.30)
PIIGS*Ireland				0.0012 (1.41)
GDP*Ireland				-0.0189 (1.47)
GDP Growth*Ireland				0.0143 (1.47)
RISK*Ireland				-0.0047 (0.10)
USD/EUR*Ireland				1.3196** (3.16)
Constant	1.5757** (2.80)	1.7333** (3.11)	0.6626 (1.68)	0.6435 (1.67)
N	138	138	676	676
Log Pseudolikelihood	-508.52	-508.44	-2407.01	-2363.70

Absolute value of z score in parentheses. ** Significant at 1% level, * Significant at 5% level, † Significant at 10% level.

Appendix III: FDI Projects and QE. Alternative Wage Specifications (Negative Binomial Regression)

Variable	Model I (NACE "m" wages)	Model II (NACE "j" wages)	Model IV (NACE "mj" wages, lagged)
QE_Δ	0.0022** (2.83)	0.0022** (2.85)	0.0022** (2.86)
PIIGS	0.0005 (1.06)	0.0006 (1.30)	0.0005 (1.10)
GDP	-0.0225* (1.96)	-0.0223* (1.95)	-0.0226* (1.97)
GDP_%Δ	0.0109 (1.32)	0.0117 (1.39)	0.0103 (1.26)
RISK	0.0404 (1.03)	0.0361 (0.91)	0.0417 (1.07)
USD/EUR	1.4180** (3.38)	1.3730** (3.30)	1.4261** (3.40)
Wages_Δ	-0.0008 (0.67)	-0.0010 (0.77)	
Lagged Wages_Δ			0.0005 (0.33)
Constant	1.5731** (2.80)	1.6286** (2.88)	1.5496** (2.72)
N	138	138	138
χ²	30.28	30.56	29.71
Prob > χ²	0.0001	0.0001	0.0001

Absolute value of z score in parentheses. ** Significant at 1% level, * Significant at 5% level, † Significant at 10% level.

Appendix IV: List of Interviewees

1. Director of Planning, IDA
2. Retired chief executive IDA
3. Retired chief executive IDA
4. Retired chief executive IDA
5. Board member IDA
6. Board member IDA
7. Secretary board IDA
8. Vice President IDA, California
9. Vice President, IDA, California
10. Minister, Department of Jobs, Enterprise & Innovation
11. Principal Officer, Department of Jobs, Enterprise & Innovation
12. General secretary, Department of Expenditure & Reform
13. European Commission Representative, Ireland
14. IBEC official
15. IBEC researcher
16. ICTU researcher
17. All corporate executives asked to remain anonymous

Appendix V: 80 tech-oriented firms based in Ireland (name and year of investment)

Firm	Investment Year
HP	1971
Analong Devices	1977
Apple	1980
IBM	1981
Microsoft	1985
Oracle	1987
Intel/Altera	1989
Dell	1991
Symantec	1991
Novell	1995
Xerox	1998
BMC	2001
Skillsoft	2002
SAP	2003
Amazon	2004
Google	2004
McAfee	2004
Paypal	2004
ebay	2004
Qlogic	2005
Xilinx	2005
Netgear	2006
Sandisk	2006
Vmware	2006
Cisco	2007
Citrix Systems Ireland	2007
Commscope	2007
Synopsys	2008
Workday	2008
Accenture	2009
Bently Software	2009
Facebook/Instagram	2009
Maxim Integrated Products	2009
Trend Micro	2009
LinkedIn	2010
Riotgames	2010
SalesForce	2010

Seagate	2010
Webroot	2010
EA	2010
EngineYard	2011
Guidewire	2011
Teradata	2011
Twitter	2011
Zynga	2011
Pinger	2011
Marketo	2011
Gilt	2011
Quest	2011
Capita Managed IT Solutions	2012
Dropbox	2012
Indeed.com	2012
Innovative Interfaces	2012
LogMeIn	2012
Nimble Apps	2012
Yapstone	2012
Ancestry.com	2012
Total Defense	2012
Adroll	2013
Airbnb	2013
Cadence	2013
Datahug	2013
Etsy	2013
Hubspot	2013
LexisNexis	2013
Qualtrics	2013
Soundwave	2013
squarespace	2013
10gen	2013
MongoDB	2013
Qualcomm	2013
Adara	2013
Mandiant	2013
FireEye	2013
TripAdvisor	2013
Overstock.com	2013
Marin Software	2013

Zendesk	2013
Calypso Technology	2014
Groupon	2014
Itron Inc	2014
New Relic	2014
SmartBear	2014
Storyful	2014
SurveyMonkey	2014
SWG, Inc	2014
Tintri	2014
VCE	2014
Yelp	2014
Artisan Infrastructure	2015
Coupa	2015
Data Clarity	2015
DocuSign	2015
Ellucian	2015
Malwarebytes	2015
NuoDB	2015
Slack	2015
Stryker	2015
Uber	2015
Wrike	2015
Yahoo!	2015