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ENTREPRENEURSHIP DYNAMICS, MARKET SIZE AND FISCAL POLICY

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Entrepreneurship Dynamics, Market Size and Fiscal Policy

Abstract

The current recession has highlighted the potentially severe impact of shrinkages in demand and fiscal austerity upon firm entry and survival. Using data covering broad manufacturing and service sectors in 17 countries this paper investigates how changes in fiscal policy and market size affect rates of firm entry and exit. We find that reductions in fiscal expenditure are associated with higher rates of entrepreneurship and that there are differences between more disaggregated policy factors such as government consumption, investment and taxation. Quantitatively more important is market size. In the immediate aftermath of a 5 percent reduction in market size the rate of entry falls by approximately 0.25 percentage points while the exit rate rises by a similar amount. Although small in comparison with average rates of entry and exit this corresponds to a loss of 17,500 firms in the United States. Changes in fiscal expenditure are estimated to have a slightly smaller effect.

Keywords: Entry, Exit, Demand, Fiscal Policy

JEL Codes: D22, E32, L26, H32, H11

Entrepreneurship Dynamics, Market Size and Fiscal Policy

1. Introduction

It is anticipated that the world's economies will be faced with severe macroeconomic challenges over the next decade. The global financial crisis and the resulting global recession led to the closure of many firms, rising unemployment and high levels of public debt in most developed countries. Despite the end of the recession, fears for the future growth of demand remain. The need to reduce public sector deficits, built up partly as an initial response to the crisis, through increases in taxation and reductions in government expenditure have led some to predict that growth will remain low, and unemployment high, for many years to come.

Against this macroeconomic backdrop, entrepreneurs and entrepreneurship (in this case identified by rates of new firm entry and exit) have been identified as a potentially important factor needed to drive future growth and employment in many countries.[1] The evidence to support this as a possibility is relatively plentiful. Leonard (1987) for example estimates that the creation of new firms accounts for 11 per cent of the total outflows from unemployment, while Bartelsman et al. (2005) find that employment levels in new entrant firms can expand rapidly. The process of creative destruction has also been found to play an important role in generating productivity growth at both an industry and economy-wide level. For the United States, Foster et al. (2001) calculate that 35 per cent of productivity growth over a five year period is attributable to firm births and deaths. Similar evidence exists for Canada, where Baldwin and Gu (2002) find plant turnover contributes 15-25 per cent of labour productivity improvements between 1973 to 1997. Finally, for the UK Disney et al. (2003) estimate that 49 per cent of total labour productivity growth in the manufacturing sector between 1980 and 1992 is explained by the net-entry of firms.

Yet, while that confirms the potential for entrepreneurship as a future driver of employment and growth, it leaves open the question of whether the present macroeconomic conditions of weak (domestic and foreign) demand[2] and fiscal retrenchment may themselves reduce the level of entrepreneurship that takes place, thereby undermining the role that entrepreneurship may play in any macroeconomic recovery. To develop an answer to that question in this paper we explore what, if any, is the relationship between fiscal policy (taxation and expenditure), the growth of demand

[1] In the UK this has additionally been framed in policy discussions as a way of achieving a desired rebalancing of the economy away from the financial services sector.
[2] The terms market access, market demand and market size are used interchangeably throughout the paper.

(domestic and foreign) and entrepreneurship dynamics (the rate of new firm entry and exit). For this task we use data for entry and exit rates covering 28 2-digit industries (both manufacturing and services) in 17 OECD countries over the period 1998 to 2005.[3]

In studying these questions we build on a relatively small literature on this topic. For market access there exists strong evidence in Kessides (1991) and Mata et al. (1995) that domestic profitability affects rates of entry. The effect of changes in foreign market access has been less commonly studied. An exception is Sleuwaegen and Dehandschutte (1991) who show for Belgium that the size of the European market is important for new firm entry, while Bernard et al. (2006) find that greater import competition raises the probability of plant closure. The literature on fiscal policy meanwhile, has tended to focus on the role of taxation either in a single country setting using entry into self-employment (Gentry and Hubbard, 2000; Carrol et al., 1998; Cullen and Gordon, 2007; Kneller and McGowan, 2011) or on entry through incorporation using cross-country data (Da Rin et al., 2011; Djankov et al., 2010). In using cross-country data on entrepreneurship the papers most closely related to our study are those by Da Rin et al. (2011), Djankov et al. (2010) and Kneller and McGowan (2011), albeit where they focus on the effects of corporate income taxation (Da Rin et al. 2011; Djankov et al., 2010; Kneller and McGowan, 2011) and income taxation (Djankov et al., 2010; Kneller and McGowan, 2011).[4]

To understand the relationship between current macroeconomic conditions and entrepreneurship dynamics necessitates a number of modifications to the methodology and data used compared to the existing literature. Firstly, given our interest in the stock of enterprises, we use data that captures entry and exit of incorporated firms as well as sole-traders, partnerships and other enterprise types.[5] As identified above, most of the estimated effects of demand levels or fiscal policy exist for either the entry *or* the exit margin but rarely both. Similarly, focusing only on a single enterprise type (self-employment, incorporation etc.) may lead us to over-estimate the effects of demand or fiscal policy changes if, as Cullen and Gordon (2007) discuss for tax changes, it encourages substitution between different enterprise forms.[6] Secondly, we broaden the measure of fiscal policy beyond taxation to capture the possible effects of both tax and expenditure changes, while our measure of industry demand captures both domestic demand levels, and in an increasingly integrated global economy, those of foreign markets.

[3] Together the datasets provide information on entry and exit rates for 25 countries. However, owing to the choice of estimating methodology and missing data on fiscal variables, only 17countries are included in the econometric analysis for which summary statistics are reported in Tables 1 and 2.
[4] The Da Rin et al. (2011) study is also confined to the entry of incorporated firms.
[5] More details on this dataset can be found in Kneller and McGowan (2011).
[6] The data we use does not allow us estimate these effects for each type of enterprise separately.

A third alteration we make arises out of a concern that the estimated effects of fiscal policy on entrepreneurship dynamics may be subject to endogeneity bias. If, as seems likely, hard to measure changes to the detailed regulations governing entry and exit in a country are omitted from the regression but are correlated with the direction of changes to fiscal policy that we observe, because they too are determined by the economic beliefs of the ruling economic party for example, this will lead to a correlation with the error term in our equation and therefore biased coefficient estimates. The design of our empirical strategy is based on the study of financial development and growth by Rajan and Zingales (1998).[7] Following that paper, to overcome this endogeneity bias we exploit the panel structure of the data to estimate a difference-in-differences model (Angrist and Pischke, 2009). As the country-time effects we include as part of this strategy are collinear with changes to fiscal policy in a country, we identify the effects of fiscal policy on entry and exit by exploiting variation in their effects across industries.[8] We consider a range of industry characteristics that include average profitability, ICT and human capital intensity which have been shown elsewhere to be correlated with entrepreneurship. Finally, our estimating framework accounts for the inter-dependence between entry and exit rates discussed by Bartelsman and Doms (2000) and others, and following Burke et al. (2009) and Manjon-Antolin (2010) for the dynamics present in these data. We use these dynamics to model the possible distinction between the short-run and long-run effects of market access and fiscal policy on entrepreneurship.[9]

We find that these modifications are important for the results that we derive. From our analysis we find that both market size and fiscal policy matter for entrepreneurship dynamics. Entry rates are found to be affected by both increased market size and changes to government expenditures and revenues. One important difference is that whereas we find the effects of market size upon entrepreneurship only matter in the short-run, changes in fiscal policy tend to have persistent effects on entry and exit rates. With regard to the global economic crisis these results suggest that the recessions experienced in many countries are likely to have affected entry and exit rates for only a short period of time, whereas the effects of changes to fiscal policy are likely to have been initially small but become relatively more important over the longer run.

[7] Da Rin et al. (2011) argue that historic entry rates may be correlated with contemporaneous tax rates on the basis that policy makers respond to macroeconomic shocks by altering tax rates to accommodate entrepreneurs. This form of simultaneity bias would suggest that future changes in taxation, or fiscal policy, are explained by current changes in the industry rate of entry or exit. To the extent that tax rates are determined by current macroeconomic conditions this is controlled for in our regressions using market demand.

[8] We also include industry fixed effects.

[9] The existing literature has usually assumed that the effects of tax policy or market access changes are persistent and that adjustment to this long-run rate is instantaneous.

In general we find that the effects of increased government size are offsetting: increases in government expenditures lead to lower rates of entry and higher rates of exit, whereas an increase in government revenues increases entry and reduce exit rates.[10] During the global economic crisis, because government expenditures and revenues tended to move in opposite directions, fiscal policy changes will have tended to make entrepreneurship dynamics more volatile than normal. The expansionary fiscal phase would have been associated with a net decline in entry rates and an increase in the rate of firm death, conditions for entrepreneurship initially worsened and potentially exacerbated the negative employment and output effects of the crisis, whereas as these changes are reversed over the next decade there will be a improvement in the conditions for entrepreneurship again. Whether the final net-outcomes are positive or negative will depend of course whether the size of government ends up above or below its pre-recessionary levels, while the time path will depend on the pace at which the initial fiscal stimulus is withdrawn.

Of course, any change in the rate of entry and exit caused by changes in fiscal policy or market size, even short-run, will lead to changes in the stock of firms within an economy. Here we find that even though the effects on entry and exit rates are quite small compared to the volume of entry and exit that takes place in many industries and countries, the impact on the total number of firms can appear quantitatively large. The average rate of entry and exit per annum are in the range 8-9 per cent across most OECD economies. We find that the estimated effect of a one standard deviation change in market access is in the order of 0.22 percentage points in the first year, while the long-run effects of (disaggregated) fiscal expenditure or revenue changes on long-run rates are only 0.06 percentage points. These effects are clearly very modest relative to the typical volumes of entry and exit. They can however, have what appear as large effects on the total number of firms. Every 0.1 percentage point change in the entry or exit rate implies a change in the stock enterprises of around 3,900 in the US and 1,500 in France, Germany and the UK.[11]

Our results are robust to changes in the method used to calculate demand levels and to disaggregation of the fiscal variables. Indeed for the latter we find some differences in the likely effects of fiscal policy over the coming decade. If governments attempt to re-balance their budgets through reductions in the level of consumption spending and increases in taxation while reducing investment expenditure our results suggest that the

[10] Higher levels of government expenditure have a crowding out effect leading to the decrease in entrepreneurship.
[11] This effect depends on the total stock of enterprises in each country. According to OECD data there are around 3.9 million enterprises in the US and 1.5 million in France, Germany and the UK.

effects are likely to be to some extent offsetting. We find that entry rates rise and exit rates fall with reductions in government consumption spending whereas entry rates fall and exit rates rise if government investment spending decreases. For taxation we find that personal and corporate income tax rate changes also have oppositely signed effects. Increases in personal income taxation are associated with more entrepreneurship and increases in corporate taxes less entrepreneurship, although here the effects are only short-run. Which of the expenditure and tax changes dominates during the current fiscal retrenchments will of course depend on the relative size of these changes, although for the same sized change in both fiscal variables our results suggest that the changes to corporate taxation will dominate in the short-run and changes to government consumption spending in the long-run.

The rest of the paper is organised as follows. A brief review of the literature on factors that have been shown to influence firm entry and exit is provided in Section 2. Section 3 contains a summary of the data and Section 4 builds on this to provide econometric estimates of how fiscal policy, market size and country-specific factors affect creative destruction. Robustness checks are conducted in Section 5 and finally conclusions are drawn in Section 6.

2. Economic Background

Greater entrepreneurship is associated with an increase in the number and type of goods and services offered to markets. Often these new products and services are produced by new firms. Some of these firms are successful and grow, whereas other ideas are rejected by consumers and these firms quickly die or other older firms exit as a result of the increase in competition.[12] New enterprises can take many different forms, such as self-employed or incorporation. This distinction is most relevant when discussing the effects of taxation on the entrepreneurship decision, where the type of enterprise created is likely to be determined by the rate of personal versus corporate income taxation and the progressivity in the tax schedule. Gentry and Hubbard (2004) demonstrate that the effects of taxation on the decision to create a new business are ambiguous. Under an assumption that entrepreneurial income is uncertain compared to wage income (entrepreneurs have a probability of either being successful or unsuccessful) then increased taxation reduces the return from being an entrepreneur but also reduces the variance of income. For risk-averse agents this latter effect reduces the risk of entrepreneurial income raising its relative attractiveness. To this Cullen and Gordon (2007) add that statutory rates of

[12] See Dunne, Roberts and Samuelson (1988) for a discussion of the types of entry that can occur and Baker and Kennedy (2002) for a discussion of exit. Baldwin and Gorecki (1991) discuss measurement problems.

corporate income taxation are typically lower than those on personal income, increasing the likelihood of entry by incorporation.

The predictions of these models are tested empirically using US data on entry by Gentry and Hubbard (2000), Carrol et al. (1998) and Cullen and Gordon (2007) and using cross-country data in Djankov et al. (2011), Da Rin et al. (2011) and Kneller and McGowan (2011). Studies using individual-level data for the US consider the effects of taxation on self-employment while those using cross-country data examine the entry of incorporated firms. Gentry and Hubbard (2000) for example, model the probability of becoming self-employed (which they use as a proxy for entrepreneurship) as a function of tax progressivity in the US. They find strong evidence that greater progressivity of the tax rate, captured as the marginal tax rate faced when entrepreneurship is unsuccessful compared to successful, is associated with a lower probability of choosing self-employment.

The approach taken by Djankov et al. (2011) uses survey-based information to build the tax burden of a 'standard' company with similar characteristics across all countries (the company produces and sells flower pots). They find that this measure of the tax burden is significantly negatively correlated with the rate of entry in a cross-section of developed and developing countries, as well as other performance measures such as aggregate investment and FDI. Da Rin et al. (2011) alternatively apply measures of effective average tax rates due to Devereux and Griffith (1998a, b) in a panel data setting (2-digit industry level data for 17 European countries from 1997 to 2004), allowing them to control for additional country- and industry-specific effects. They uncover a significant non-linear relationship between entry of a new incorporated firm and effective average tax rates that is robust to the use of an instrumental variables approach to correct for any endogeneity bias. Finally, Kneller and McGowan (2011) study the effect of changes to corporate and personal income taxation using the same dataset as that used here. Using a difference in differences strategy they find that increases in corporate taxation significantly decrease rates of entry and that the effects of personal tax changes are complex. Increases in marginal tax rates at low income levels are found to decrease entry rates and increase exit, whereas the opposite occurs for changes to marginal tax rates at higher income levels.

Unlike the tax literature, the effects of market size have been studied for both entry and exit, although typically not in the same study, and more commonly with a focus on either

domestic or foreign demand conditions.[13] Beginning with domestic demand factors, a number of studies have shown that a crucial factor shaping patterns of entrepreneurship is the expected value of entry. Kessides (1991) finds for example that entry is increasing with the profit level of incumbents, while Mata et al. (1995) find that new plants are likely to live longer if they enter growing industries, or those with little current entry activity. Of interest in the context of this paper, the rate of entry of new firms has also been linked to the macroeconomic fluctuations of the economy. Using cross-sectional data on 117 industries across the years 1976-1986 Acs and Audretsch (1994) find that macroeconomic expansions are a catalyst for new firm birth, with a 1 per cent increase in GNP growth raising start-up rates 0.052 per cent. They also find that entry rates are positively correlated with a low cost of capital and high unemployment rates however, which may suggest that entry rates do not differ substantially depending upon whether the economy is in an expansionary or recessionary phase. This accords with the summary evidence presented for the US by Stangler and Kedrosky (2010). Using data from 1977 to 2005 they show that the number of new businesses fluctuates each year around a long-run trend but does not appear to be strongly affected by recessionary periods (or indeed other large political, economic or policy events).

For the importance of foreign market conditions, Sleuwaegen and Dehandschutte (1991) show that European-wide growth and profitability prospects are positively correlated with the rate of entry of firms in Belgium. Greater integration of economies leads of course both to an increase in the size of markets that domestic firms can sell to but also greater competition from overseas firms. This leads to an increase in the rate of death of firms. In their study of the U.S. Bernard et al. (2006) find that greater import competition raises the probability of plant exit while Greenaway et al. (2008) find that intra-industry trade affects the type of exit that takes place (closure, industry switching or a merger/acquisition). Finally, Gibson & Harris (1996) study the effects of trade liberalisation, captured by changes in the effective rate of assistance and a measure of quotas within the industry, on the probability of plant closure in New Zealand and find that both of these variables significantly increase the probability of exit.

3. Estimating Equation and Data Description

We model entry and exit using the following pair of regression equations (equations 1 and 2). The rate of entry (EN) or exit (EX) in industry *j* of country *i* at time *t* is modelled as a function of both lagged entry and exit. Our choice of a dynamic regression model is

[13] A useful theoretical contribution demonstrating the value of domestic and foreign market size is by Melitz (2003).

motivated by both theoretical and empirical considerations. Hopenhayn (1992), for example, presents a dynamic model of entry and exit in which entry and exit rates are equal in the steady state equilibrium. Temporary shocks to the entry rate say, will lead to a deviation away from the long run equilibrium leading to an increase in the number of firms in the industry. Exit rates respond to this increase in competition for market share by increasing temporarily leading to the number of firms tending back towards the steady state equilibrium thereby restoring equilibrium between entry and exit rates. This process of interdependence is supported by recent empirical work. For example, Burke et al. (2009) and Manjon-Antolin (2010) show the dynamic adjustment parameters to be important with lagged entry rates being strongly correlated with contemporaneous exit rates and vice versa. Such evidence confirms the high correlation between entry and exit even in narrowly defined industries discussed in Geroski (1995). The inclusion of the cross-equation terms also attempts to control for the cross equation correlation between the error terms (Geroski, 1995; Baldwin and Gu, 2002). Consequently, we estimate equations (1) and (2) using a feasible generalised least squares estimator which uses a weighting matrix to provide more efficient estimates due to the cross-equation correlation of the error terms.[14]

A well-established methodology consistent with the interdependence between entry and exit rates as well as their tendency to converge towards long run equilibrium is an error correction model of the type set out in equations (1) and (2). The short-run effect of one of the independent variables will be captured through the change in that variable (for example, α_5 denotes the short-run effect of an increase in market access on entry rates). This will generate a temporary response in the entry/exit rate after which the entry/exit rate will return towards the steady state. The speed at which this occurs will of course depend on the magnitude of the parameters α_1 and α_2 in the case of entry and β_1 and β_2 for exit. The long-run effect of a change to one of the independent variables will be given by the lag of that variable (for example, α_4 denotes the long-run effect of an increase in market access on entry rates). This will lead to a permanent shift in the rate of entry and exit. For example, where market access leads to a permanent rise in the entry rate, exit rates will also increase in the long run equilibrium. Our regression equations are therefore able to capture the dynamic interaction between entry and exit and unlike previous studies, the independent variables are not constrained to have only a permanent effect on entry and exit rates.

[14] The correlation between the error terms in regressions 1 and 2 of Table 1 is calculated to be -0.1933. A Breusch-Pagan test of independence gives $chi^2(1) = 72.637$ (p-value = 0.000), indicating a statistically significant correlation between the errors in the two equations.

The effects of changes to fiscal policy are denoted by FP in equations (1) and (2) and vary across countries (*i)* and time *(t)*. The level and changes in demand are measured at the country-industry level (and labelled MA), the construction of which we describe below. We also include a full set of country-time (γ_{it}) and industry (γ_j) effects, while ε_{ijt} is a random error term.[15]

$$\Delta EN_{ijt} = \alpha + \alpha_1 EN_{ijt-1} + \alpha_2 EX_{ijt-1} + \alpha_3 \Delta EX_{ijt} + \alpha_4 MA_{ijt-1} + \alpha_5 \Delta MA_{ijt} + \alpha_6 Indust_j * \Delta FP_{it} + \alpha_7 Indust_j * FP_{it-1} + \gamma_{it} + \gamma_j + \varepsilon_{ijt} \quad (1)$$

$$\Delta EX_{ijt} = \beta + \beta_1 EX_{ijt-1} + \beta_2 EN_{ijt-1} + \beta_3 \Delta EN_{ijt} + \beta_4 MA_{ijt-1} + \beta_5 \Delta MA_{ijt} + \beta_6 Indust_j * \Delta FP_{it} + \beta_7 Indust_j * FP_{it-1} + \gamma_{it} + \gamma_j + \varepsilon_{ijt} \quad (2)$$

As explained in the introduction we are concerned with the effects of endogeneity bias on our results. Of the potential sources of endogeneity bias (omitted variables, simultaneity and measurement error) perhaps most important in the current context is the potential omission of other relevant variables.[16] The error term in our regressions may represent unobservable (to the econometrician) policy detail or political related barriers to entrepreneurship that are correlated with the direction of changes to fiscal policy. For example, entrepreneurship policy may appear to be similar in two sets of countries but their application may depend on the efficiency and vigour of the bureaucracy, which is itself affected by the attitude of the current government towards the public versus private provision of goods and services. The entrepreneurship preferences of the government may itself affect the likelihood and direction of fiscal reforms. Alternatively, in the current global economic crisis, the direction of fiscal policy has been determined by the health of the financial sector of the economy, where this will also affect entrepreneurship though the willingness of banks to lend to existing or new enterprises. Since we believe the source of the endogeneity bias to occur at the country level, we include in our regressions a full set of country-time effects.[17]

The country-time effects we include are of course perfectly collinear with the (country-time) fiscal policy reforms that are of interest in this paper. To identify the effects of taxation we follow Rajan and Zingales (1998) and use a difference-in-differences

[15] The entry and exit rates, as well as the market access variable are measured in logarithms while the other variables in the regression are measured in levels. The statistical properties of this semi-log specification are appropriate given that entry and exit rates are bounded at zero.

[16] Simultaneity bias would suggest that future changes in fiscal policy are explained by current changes in the industry rate of entry or exit. The importance of this bias is likely to be reduced in our data given that they vary across industries. To the extent that tax rates are determined by current macroeconomic conditions we also include a measure of market demand. We also cannot rule out the possible presence of endogeneity bias due to measurement error. Classical attenuation bias would normally be expected to bias our estimated coefficient towards zero.

[17] Baier and Bergstrand (2007) provide detailed discussion on why fixed effects are a valid means of overcoming endogeneity bias in a panel data setting. Our choice of modelling strategy is discussed in greater detail in Kneller and McGowan (2011).

estimation framework of the type described in Angrist and Pischke (2009). The effects of changes in fiscal policy on entry/exit are captured by the interaction between the time invariant industry variable and FP, which is the relevant measure of government consumption, revenue or taxation, and which varies across countries and time. The use of an interaction term to identify the effects of fiscal policy is based on a view that the underlying characteristics of an industry can make it more, or less attractive to entrepreneurship, and therefore so will its response to a change in fiscal policy. Our choice of industry variables are intended to capture a number of characteristics that have been shown to affect entrepreneurship. We choose profits on the basis that it represents the tax base to which the corporate tax rate is applied and has been shown to attract entrepreneurs (Kessides, 1991; Schwalbach, 1991) and cause exit (Sleuwaegen and Dehandschutte, 1991). Elsewhere in the literature it has been argued that entrepreneurial returns may be higher in industries that intensively use human capital, or those where ICT investment is more important, since such features are perceived to be correlated with successful innovative products and processes (Griffith et al., 2004). Whilst justification can be found for these alternative industry measures, we leave which is the most important industry characteristic for mediating the effects of fiscal policy as an empirical matter. In all cases we follow Rajan and Zingales (1998) in using (time invariant) data for the United States to ensure the exogeneity of the industry variables and because it is subject to the fewest government distortions.

Entrepreneurship Data

The data on entry and exit that we use in our empirical analysis are drawn from the OECD Structural Demography Business Statistics (SDBS) and Eurostat Firm Exit and Entry Data Dimensions (FEED) datasets. These datasets use the same methodology and original data sources (business registers) to provide detailed information on the number and size of firms across (OECD or European) countries, industries (ISIC 2-digit) and time as well as the number of new firms that enter or exit as a ratio of the remaining population of firms (Eurostat-OECD, 2007). Data relates to 'all enterprises'. An enterprise is defined in the data as "the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations" (Eurostat-OECD, 2007). The legal forms included cover limited liability companies, partnerships, sole-proprietors and public corporations.[18]

[18] We therefore observe the total stock of entrants, exits and continuing firms for each country, industry and year although the data do not permit disaggregation of these stocks according to each legal form.

A birth in this data set is defined as the creation of an enterprise that is registered in the business register of that country (corrected for errors). A birth amounts to the creation of a combination of production factors with the restriction that no other enterprises are involved in the event. Births do not include entries into the population due to: mergers, break-ups, split-off or restructuring of a set of enterprises. It also excludes entries into a sub-population resulting only from a change of activity (Eurostat-OECD, 2007).[19] Exits are defined in a similar way. We choose to concentrate on sectors of the economy where public provision is less likely and therefore use data for the manufacturing sector (ISIC codes 15-36) and for some specific service sectors (to ISIC codes 50-74). The dataset provides information on a total of 17 countries. The time periods available differ markedly across countries. For example data for Belgium (OECD SDBS) exists for just two years. In comparison the time series for the UK, Sweden and Spain extend from 1998 to 2005.[20] The econometric methodology employed in the paper will result in the loss of those countries that have very short time series of data from the sample.

To summarise the patterns of entrepreneurship within our data we present the average rates of entry and exit and net entry (entry-exit) for each country and broad industry (manufacturing or services) in Table 1. A general observation would be that the cross-country differences in the rate of firm turnover are large. In the manufacturing data the country average rates of churn (entry plus exit) lie in the range 9.47 per cent (Italy) per annum to 18.05 per cent (United Kingdom) and in the service data from 11.75 per cent (Sweden) per annum to 22.79 per cent (United Kingdom). These figures are of a comparable magnitude to those reported in other studies. Bartelsman et al. (2005) for example report rates of churn for 16 countries from the early 1980's to 2001 as between 20-25 per cent per annum. Similarly, Roberts and Tybout (1997) using data for Chile, Colombia and Morocco report turnover rates of approximately 25 per cent per annum, while Aw et al. (1997) report for Taiwan an exit rate of 87 per cent over a 10 year period.

Table 1 suggests there are consistent differences in rates of entrepreneurship across industries. In all of the countries for which there are data on both the manufacturing and services sector, the rate of churn in the service sector is consistently higher than that for manufacturing. This presumably reflects differences in the fixed costs of market entry in these two sectors (Bartelsman and Doms, 2000). The table also suggests that country-specific factors may also play a role in determining rates of entrepreneurship however.

[19] Under the OECD/Eurostat (2007) definition: "The enterprise is the smallest combination of legal units that is an organisational unit producing goods or services, which benefits from a certain degree of autonomy in decision-making, especially for the allocation of its current resources. An enterprise carries out one or more activities at one or more locations. An enterprise may be a sole legal unit." (http://www.oecd.org/dataoecd/8/9/39974480.pdf).

[20] See Appendix Table A1 for a summary of the countries in the data and the time span for which this is available.

The rate of entry and exit is consistently higher in both the manufacturing and services sector for the UK compared to France, the Netherlands and Belgium. Consistent with the idea that this may reflect different regulatory environments in these countries, the UK ranks higher than France, Netherlands and Belgium on the World Bank's Ease of Doing Business indicators of the monetary and time cost, as well as the number of procedures involved in opening or closing a business. Such differences between sectors and countries are captured in the regression through the inclusion of a full set of (time invariant) industry and (time varying) country dummies.

[Table 1 around here]

Table 1 also provides evidence of differences between the rate of entry and exit across sectors and countries. In most countries the differences between the rate of entry and exit every year, the level of net entry, are small compared to the level of churn. In the manufacturing sector in particular only for Portugal and Slovakia is there net growth of firms greater than 1 per cent. Faster net growth of firms occurs more frequently in the services sector. Here there are 8 countries in which net growth is 2 per cent or above, where this includes countries as diverse as France and Slovenia. Finally, we note that for a number of OECD economies there is evidence of de-industrialisation. The number of firms in the manufacturing sector has declined across the sample period in many countries, where this list includes the UK, France and Italy.

Table 2 considers the churn and net entry position by industry at a more detailed level. In Table 2 we aggregate across countries to consider whether there has been net growth or net decline in the number of firms within each industry across countries. As might be expected the country total in Table 1 hid significant variation across sub-sectors of the manufacturing and service sectors. For example the general declines in the number of firms within the manufacturing sector are in fact confined to five sub-industries: food products, textiles, leather, wood and wood products and rubber and plastics. These might generally be considered industries where collectively the OECD countries have a comparative disadvantage relative to non-OECD countries. In the remaining manufacturing industries the net entry rate is actually positive, with increases of around 0.5 per cent per annum or greater. Industries where there has been a net increase in the number of firms include the electronic equipment, machinery and equipment and transport equipment industries. This may reflect the trend towards offshoring and outsourcing in these industries.

Disaggregating by type of service industry we find that the rise in the number of firms is a general finding. In only the retail trade, land transport and insurance industries has

there been evidence of a small net decline in the number of firms. For some industries the increase in the number of firms is marked. Net entry is above 2 per cent per annum in the auxiliary finance, post and telecommunications, real estate, computer related activities, research and development and other business activities sectors. This finding would seem to point to the importance of changes in market size and technological change as drivers of net entry and appears to be particularly true for service industries in which the relevant market is the global market.

[Table 2 around here]

Market Demand, Fiscal Policy and Industry Characteristics

To measure the effects of changes in domestic and foreign markets we follow Harris (1954) and calculate a measure of total market size as the sum of domestic and foreign income divided by the distance to that market. As in Hanson (2005) we allow the discount rate on distance to differ across industries. As in those papers we label this as Market access (MA) and calculate it using the following equation

$$MA_{ij} = \sum_{k=1}^{N} AC_{ik} Dist_{jk}^{-\delta i}$$

Where AC denotes apparent consumption (the sum of output – exports + imports); *j* denotes the home country, *k* foreign countries and *i* industries; *Dist* refers to the distance between the home and the foreign country and δ refers to the discount parameter on distance. When we set δ =-1 this collapses to the specification used by Harris (1954). In the absence of information on exports and imports for the service sector in those industries AC is measured using output data only. Data on output, exports and imports are taken from the OECD STAN database which provides information at the two-digit ISIC level of disaggregation. We construct three measures of market access, each making a different assumption regarding the effects of distance. In the main measure that we use we set the value of distance equal to those reported in Table 4 for manufacturing by Kneller et al. (2008). For services we take the value estimated by Head et al. (2009) of -1.35. To establish the robustness of our findings to the assumptions regarding the importance of foreign markets we calculate an alternative measure of market size where we set the distance parameter equal to -1 for both manufacturing and services (as in Table 5). This makes foreign markets relatively more important. The third measure we construct reflects the non-traded nature of retail and wholesale trade, hotels and restaurants. We set the distance parameter for those industries equal to -2 meaning that in these industries foreign markets are relatively unimportant.

Our measures of government expenditure, revenue, consumption and investment are taken from the OECD National Accounts dataset where each variable is measured as a share of GDP. We use these measures of fiscal policy because they provide a more complete coverage of the countries and time periods covered in our entry-exit data. Later in the paper we use data on disaggregated expenditures, also taken from the OECD, and on tax rates. The data for top statutory corporate tax rates and income tax rates we use are obtained from EUROSTAT, *Taxation Trends in the EU*.

In Table 3 we provide summary statistics on the market access and fiscal variables used in the econometric model. The mean (of the log) market access value corresponds closely to that in Slovenia (4.96) but countries such as the Netherlands (6.05) have substantially greater market access because of their proximity to large foreign markets. Equally, large domestic markets also affect the variable with large countries such as Germany (5.92) and the United Kingdom (5.54) recording higher values than small and remote economies. The fiscal variables also exhibit considerable variation between countries. For example, the share of government consumption in GDP is considerably higher in Sweden (26.5 per cent) compared with Spain (17.4 per cent) while the top rate of marginal income tax ranges from 19 per cent in Slovakia to 60.6 per cent in Belgium.

[Table 3 around here]

Finally, Information on the profitability of industries is calculated from the 2002 U.S. Benchmark Input-Output Data Table (*U.S. Bureau of Economic Analysis*, 2002). For each industry at the 2-digit ISIC level a profitability ratio is calculated from data on gross operating surplus divided by value added; this is applied to the whole period of our analysis, 1998-2005. The data for ICT and human capital are again for the US for the year 2000 but are from EUKLEMS. Again, this data is provided at the 2-digit ISIC level.

4. Econometric Analysis

[Table 4 around here]

Before moving on to discuss the results for market access and the fiscal policy variables we briefly discuss the results for the other control variables included in the regression equation. In regressions 1 to 6 the coefficients on the lagged dependent variables are negative and less than one. That they are less than one in absolute terms implies that entry and exit rates (the number of firms entering or existing over the population of firms) are stable over time. As expected, entry and exit rates do not continue to trend upwards or downwards following a change to one of the variables in the equation. The signs on the

lagged entry and exit variables in columns 1 to 6 indicate that changes in the independent variables, for example market size, alter the timing of entry and exit. An increase in market access for example will encourage the entry of new firms this period, but the next period entry rates will fall below the long-run path. The consequence of this is that following a change in one of the determinants of entrepreneurship, entry and exit rates will ratchet up and down in a saw tooth motion back to the long-run rate. This pattern might occur because new entrepreneurs are able to affect the timing of entry and exit to a limited extent, across a couple of years say, or because those providing finance to new entrepreneurs wish to diversify risk away from industries that have witnessed lots of entry and exit in a single period.

That the cross-equation terms are significant also suggests something interesting for our results. This implies that any variable that causes entry rates to rise over time will also lead to a rise in exit rates, even if that variable itself has no direct effect on exit rates. For example, any fiscal policy change that increases entrepreneurship through the entry of new enterprises in one time period will also lead exit rates to rise in the next. A similar adjustment process can be found in Burke et al. (2009) and Manjon-Antolin (2010).

Fiscal Policy and Market Access

We now turn our attention towards the relative importance of fiscal policy and market access in shaping entrepreneurship dynamics. Turning first to the market access variable, we find in all of the regressions in Table 4 there are differences between the long-run and short-run effects of market access on entry and exit rates. In none of the regressions do we find increased market access to have a statistically significant effect on the long-run rate of entry or exit whereas we find consistent impacts on entrepreneurship over shorter time horizons. This supports evidence from Scarpetta et al. (2002) that the change in industry value added is positively correlated with rates of entry amongst 5 OECD countries. The results also suggest the initial response of entry and exit to changes in market access are in different directions. In the entry regressions we consistently find the coefficient measuring the short-run effect of market access is large and positive, whereas in the exit regressions the coefficients for this same variable are again large in absolute value but negative.

[Figure 1]

To provide a visual interpretation of the effect of the market access variable on entrepreneurship dynamics in Figure 1 we use the coefficient estimates from regressions

1 and 2 to plot the effect on the rate of entry and exit following a decrease in market access equivalent to the within industry/country/year standard deviation (equal to 0.052 log points) and relative to the long-run average (across countries, industries and time) rate of entry (8.35 per cent) and exit (7.33 per cent). We calculate that this fall in market access is equivalent to a decline in market size of between 4-5 per cent across countries.

According to our estimates this decrease in market size causes the rate of entry to decrease by 0.03 log points in the first year, whereas the rate of exit goes up by the same amount. As the figure shows this equates to a change in the entry rate of about 0.25 percentage points in year one (they fall to 8.1 per cent) and an increase in exit rates of a similar magnitude (they increase to 7.5 per cent). Decreased market size initially encourages less entrepreneurship through lower entry rates and higher rates of exit. This finding is supportive of recent evidence reported for the US by Stangler and Kedrosky (2010). Using data from 1977 to 2005 they find that the number of new businesses fluctuates each year around a long-run trend but are not strongly affected by recessions. They also estimate that fluctuations in entry and exit rates are of a similar magnitude to those we report here. They calculate that the most frequent fluctuation in entry rates around their mean value is between 0 and 0.5 percentage points.

As already identified above, in Figure 1 the lines subsequently bounce around before the economy settles back to its long-run path. This saw tooth motion makes it somewhat more difficult to calculate, but the effects of the decrease in market size have converged back to the long run effect (the annual changes are below 0.1 percentage points) within 2-3 years. It would appear that, while statistically significant, the magnitude of such a change in market access is relatively modest and temporary in nature.

In addition to information about the rate at which new firms are created or die, the results from Table 4 can also be used to imply an effect on the population of firms. That the rate of entry initially decreases and the rate of exit increases following a decrease to the market access variable, by implication the number of firms within an industry will decrease. Here the numbers from a change in market access can be large, and vary across countries. To provide a benchmark against which to assess these figures: according to the OECD SDBS for the manufacturing and service sectors that we examine there are around 250,000 firms in smaller European countries such as Austria and around 1.5 million in larger economies such as the UK, France and Germany. Of the European countries the largest number of firms can be found in Italy, at around 3.2 million, a comparable number of firms to that found in the US (3.9 million). A decrease in the rate of entry of just 0.25 percentage points and an increase in exit of 0.2 percentage points would translate into a

decrease in the stock of firms by around 1,100 firms in Austria, compared to 7,000 in France, 14,500 in Italy and 17,500 in the US in year 1.

In contrast to the effects of market access, we find evidence in Table 4 that the effects of fiscal policy changes are persistent in the long-run. Our results suggest that the attempts by governments to reduce expenditure coupled with increases in tax revenues would affect both entry and exit rates in the same direction. Decreases in government expenditure and increases in government revenue are found to increase entrepreneurship (entry rates increase and exit rates decline). For government expenditures, while the sign of this effect is invariant to the industry variable chosen for identification, it is only when profitability and ICT intensity are used as the industry characteristics that the relationship is statistically significant. Our results suggest that reductions in government expenditure encourage entrepreneurship by reducing 'crowding out' of investment in the private sector. We discuss this in greater detail in the following section.

The results for changes to government revenues are similar, except now profitability and human capital appear to be the relevant industry characteristics. The results are consistent with many models of entrepreneurship (Gentry and Hubbard, 2004), where entrepreneurship is a choice made relative to the returns from employment. Our results indicate that in general, tax increases in the OECD countries have had the effect of making entrepreneurship more attractive relative to employment income over time.[21] We consider the types of taxes that have been associated with such a shift in the next section of the paper.

[Insert Figure 2]

In Figure 2 we again use the parameter estimates from regressions 1 and 2 to consider the effect of a decrease in government expenditure (multiplied with profitability) equal to the within country standard deviation (0.965 percentage points). This equates to a change in government expenditure as a ratio to GDP of about 2 percentage point points. A decrease in government expenditure of this magnitude is estimated to have only a small effect on entry and exit rates in year 1, but a larger permanent long-run effect. Our estimates imply that the average long-run entry rate would increase to 8.53 per cent (from 8.35 per cent), while the long run-exit rate would decrease to 7.15 per cent (from 7.33 per cent). A change in net-entry of about 0.35 percentage points would translate into about 900 more firms in Austria every year, 5,500 in France, 11,500 in Italy and 14,000 in the

[21] Increases in marginal personal income tax rate for example have been found to raise the likelihood that an individual will enter through self-employment (Blau, 1987; Bruce, 2000; Parker, 1996; Robson and Wren, 1999).

US every year. The effect of a change in fiscal policy has therefore a quantitatively similar impact to a change in market access in terms of the expected number of enterprises created in a given year, although the big difference is that for fiscal policy these effects persist. Following a change to government expenditure the stock of firms continues to grow over time, whereas for market access that change to the stock of enterprises is one-off.

The coefficient estimates on changes to fiscal revenues are very similar in Table 4 to those for expenditures. The estimated effects of a one standard deviation change to government revenues are however about half the size of the change in government expenditures in Figure 2 because the standard deviation is about half its size. The within standard deviation is equal to 0.570, a change in revenue as a percentage of GDP of about 1 percentage point, which translates into a permanent increase in the rate of entry by 0.1 percentage point (to 8.45 per cent) and a decrease in exit rates of about the same size (to 7.21 per cent).

Altogether these results suggest that the changes in fiscal policy expected over the next decade or so are actually likely to have a net positive effect on the volume of entrepreneurship that takes place (although these may be unwinding previous negative effects). The long run effects will of course depend whether the total size of government ends up larger or smaller than its pre-crisis level and the exact time path will depend on the speed with which fiscal adjustments are made in each country. At the very least these results imply that entry and exit rates are likely to be more volatile during this period relative to their long run average and that the time path will vary across countries according to the speed with which fiscal austerity measures are introduced.

5. Robustness Tests

In this section we consider first the robustness of the above findings to changes in the measure of market access, to the disaggregation of fiscal expenditures and to the type of taxation. In Table 5 we test whether the effects of market size are robust to the method that we use to construct this variable. The first pair of regressions we report in Table 5 assume that market access in the manufacturing and service sectors decline with distance at an identical rate (equal to -1). As a reminder currently we allow for some differences in the importance of foreign market size across industries, with foreign markets size being more important for firms in the manufacturing compared to the service sector. We choose not to present the full set of results for other explanatory variables in order to conserve

space.[22] We find that our results are robust to these changes. Increased market access is associated with an increase in the amount of entry that occurs and a decline in the rate of exit in the short, but not the long run. In columns 3 and 4 of Table 5 we consider the robustness of the market access variable to imposing a value of -2 on the distance coefficient for the retail and wholesale and hotels and restaurants sectors. This captures the fact that firms in these industries tend not to trade across borders and are significantly more reliant upon the domestic market. The results are again found to be robust to this change.

[Table 5]

In order to understand which aspects of government are correlated with entrepreneurship in Table 6 we decompose government expenditure into parts relating to the share of government consumption in GDP and the share of government investment in GDP. In the same exercise we also replace the share of tax revenues, which can be thought of as an implicit average tax rate, with data on the top marginal income tax rate and the top statutory corporate tax rate. As noted by Myles (2007) with respect to the literature on taxation and rates of economic growth, the tax rates used in regression analyses should, to the extent possible, reflect the actual effective rates that relevant economic agents face. Lee and Gordon (2005) argue that statutory corporate rates capture the relevant incentives facing entrepreneurs. While this would apply to incorporated businesses, many entrepreneurs are likely to be unincorporated in which case the top personal rate is also likely to be more relevant (Cullen and Gordon, 2007).

The coefficient estimates in Table 6 suggest quite different impacts on the entry and exit rate from these four components of fiscal policy. It is worth noting that the impact of government policy changes upon entrepreneurship dynamics continues to be mediated through a long-run effect, with corporate taxation the only exception.

Disaggregating government expenditure into parts comprising government consumption and investment produces some interesting differences with respect to Table 4. For government consumption spending we find a significant negative relationship with entry and a positive relationship with exit, irrespective of the industry measure that we use. As government consumption spending accounts for the majority of total expenditure this result is as expected and again suggests that increased government size may 'crowd out' private enterprise. Entrepreneurship as measured through exit would appear to be

[22] The explanatory variables found to significantly affect entry and exit rates in Table 4 remain identically signed and are statistically significant at similar levels.

particularly affected by changes in government consumption spending, with the estimated effect found to be roughly two to three times as large as those for the same sized change in other fiscal variables. It may be that government consumption bids up the price of debt finance or raises the price of labour by attracting potential workers away from the private sector which increases firms' operating costs and the likelihood that they will exit.

For government investment we find the opposite relationships with entry and exit rates compared to consumption spending. In regressions 3 and 4, where we use human capital as the moderating variable we find strong evidence that increases in government investment spending are associated with *more* not less entrepreneurship. The effect of increased government investment spending positively affects entry rates in human capital intensive industries and lowers exit rates.

For a change in consumption and investment spending of an equal size the coefficient estimates in Table 6 indicate that the effects of changes in consumption spending on entry and exit rates are quantitatively larger than those for investment spending. That the standard deviation of investment spending is larger suggests however that this variable has an equally important role in explaining the variation in entry and exit rates in our data. The within (country and industry) standard deviation of consumption spending (multiplied with profitability) is 0.222 compared to 0.435 for investment spending. A one standard deviation increase in consumption spending is therefore associated with a decrease in long-run entry rates of 0.06 percentage points, compared to an increase in the long-run rate of 0.06 for investment spending. The estimated effects on exit rates are also very similar: exit rates are found to increase by 0.06 percentage points in the long-run following a standard deviation change in consumption spending and decrease by 0.05 percentage points for a change in investment spending.[23] In all cases a reasonable conclusion would appear to be that the effects of fiscal expenditures on entrepreneurship dynamics even in the long-run are small.

We also consider the effects of tax policy changes in Table 6. Here we find that the effects of tax policy changes are estimated to differ depending on whether it is income taxes or the corporate tax rates that are altered. These results show that increases in the top marginal rate of income taxation are positively related to entry rates, although the effect is not statistically significant in ICT intensive industries, and negatively correlated with exit. These results appear at odds with the relationship between income taxes and entries through self-employment reported by Gentry and Hubbard (2004), but are in fact in line

[23] We use the coefficients from regressions 1and 2 in Table 6 to calculate the effects from a change in consumption spending and those from regressions 3 and 4 to calculate the effects from a change in investment spending.

with findings elsewhere in the literature. Long (1982), for example, finds a 10% increase in the average marginal income tax rate to increase the rate of self-employment by 6.4% while Blau (1987) shows that increases in marginal tax rates at higher income brackets raised the rate of self-employment using aggregate US time series regressions for the period 1948 to 1982. Parker (1996) arrives at a similar finding using UK data over the years 1959 to 1991. Other studies that find a positive relationship between marginal income tax rates and entry through self-employment are Bruce (2000) and Kneller and McGowan (2011). Finally, Robson and Wren (1999) emphasise that increases in marginal income tax rates spur entry as agents can more easily under-report income when self-employed compared to when in employment.

The results for increases in corporate taxation are consistent with the view that these act as a burden upon existing entrepreneurs and discourage entry, where we find significant short-run effects in regression 1 using profitability as the relevant industry characteristic. In regressions 2, 4 and 6 we also find that higher corporate tax rates lead to an increase in the rate of exit of firms over the long run.

In comparative terms the effects of tax changes appear to be more important than those of expenditure changes to the rate of entry and exit, with the short-run effects from corporate tax rates particularly important. A within country-industry standard deviation change in corporate tax rates (interacted with profitability) is equal to 0.495, which implies a change in entry rate in year one equal to -0.53 percentage points. This is close to 9 times larger than the long-run effect from a one-standard deviation change in consumption or investment expenditures and equivalent to a decrease of 35,000 firms in the United States. For income taxation we find no significant short-run effects but there are long-run effects on entry and exit rates. Here a one standard deviation change is equal to 0.908 and is estimated to increase entry rates by 0.13 percentage points, about twice the effect of government expenditure changes, while long-run exit rates decrease by 0.11 percentage points.

6. Conclusions

Governments typically hold entrepreneurs in high regard because of the jobs their enterprises create and the innovation and productivity growth attached to firm birth and death. In this paper we have addressed how market size and changes in fiscal policy affect entrepreneurship as measured through firm entry and exit rates. Our results show that increases in market size are associated with net entry of firms but that the effect is relatively small and confined to the short run. A one standard deviation increase in

market access would lead to approximately 17,000 firms being added to the 3.9 million existing firms in the United States.

Recently taxation has been found to affect entrepreneurs' entry decisions. We make an extension to this literature by considering the role of fiscal expenditures and taxation together shape entrepreneurship dynamics. Here we find that the effects of fiscal policy are quantitatively similar to those of market access, they are relatively small given the levels of entry and exit that occur each year, but now we find that the effects are generally persistent. A one standard deviation increase in the size of government expenditures permanently lowers entry rates by about 0.35 percentage points, equivalent to a decrease of 14,000 firms in the United States, while an increase in government revenues have a positive effect about half that size. When we disaggregate this we find that the effect of different aspects of fiscal policy upon entry and exit rates is far from homogenous. Our evidence suggests that reductions in government consumption reduce the rate of entry but also reduce exit rates, a possible indication that crowding out matters. Furthermore, reductions in the share of government investment in GDP lead to higher entry rates. By comparison increases in the top rate of marginal income taxation are found to be positively correlated with entrepreneurship while higher corporate tax rates reduce entry rates in the short run. These results are noteworthy and suggest that further investigation as to the source of these correlations is worthy of future investigation.

In terms of the current global economic crisis, our results also imply that entrepreneurship is affected by the current fiscal environment, and therefore affects its ability to improve employment, output and growth in the way that many policy makers would like.

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Tables and Figures

Table 1. Average Rate of Entry, Exit and Net Entry by Country and Broad Sector

	Manufacturing			Services		
Measure / **Country**	**Rate of Entry**	**Rate of Exit**	**Net Entry**	**Rate of Entry**	**Rate of Exit**	**Net Entry**
Belgium	4.82	6.21	-1.39	8.42	9.17	-0.75
Czech Republic	7.69	9.05	-1.36	10.61	10.39	0.22
Estonia	8.24	7.32	0.92			
Finland	4.82	5.51	-0.69	8.04	6.69	1.35
France	5.37	5.61	-0.24	10.81	6.80	4.01
Germany	6.18	5.81	0.37	11.77	10.55	1.22
Hungary	6.72	7.73	-1.01	12.707	9.75	2.957
Italy	4.50	4.97	-0.47	9.10	7.76	1.34
Luxembourg	7.34	6.33	1.01	12.74	9.27	3.47
Netherlands	5.40	6.26	-0.86	10.08	9.62	0.46
Norway	4.72	5.46	-0.74	11.71	8.48	3.23
Portugal	5.95	4.45	1.5	7.81	4.96	2.85
Slovakia	8.87	7.58	1.29	12.08	9.66	2.42
Slovenia	4.54	5.38	-0.84	9.81	6.85	2.96
Spain	6.01	5.74	0.27	10.26	5.92	4.34
Sweden	4.93	4.57	0.36	6.54	5.21	1.33
United Kingdom	8.25	9.80	-1.55	11.79	11.00	0.79
All	**6.24**	**6.45**	**-0.21**	**10.06**	**8.04**	**2.02**

Notes: Manufacturing refers to ISIC codes 15-36 and services to ISIC codes 50-74. The entry and exit data are calculated as 'all enterprises' as referred to in the text.

Table 2. Average Rate of Churn and Net Entry by 2-Digit Industry

Variable	Rate of Entry	Rate of Exit	Rate of Net Entry
Manufacturing			
Food	5.21	6.47	-1.26
Textiles	7.41	9.32	-1.91
Leather	5.41	8.14	-2.73
Wood	6.22	6.48	-0.26
Paper	7.54	6.92	0.62
Chemicals	5.57	5.49	0.08
Rubber	5.01	5.19	-0.18
Non metals	6.22	6.17	0.05
Basic metals	7.10	6.09	1.01
Machinery	5.88	5.54	0.34
Electronic equipment	5.79	5.78	0.01
Transport	7.52	6.20	1.32
Services			
Motor sales	6.98	6.36	0.62
Wholesale	9.00	8.63	0.37
Retail	8.55	8.81	-0.26
Land transport	6.86	6.99	-0.13
Water transport	8.88	7.88	1.00
Air transport	8.61	8.10	0.51
Support transport	9.47	7.59	1.88
Post & telecommunications	17.91	11.93	5.98
Finance	10.08	8.46	1.62
Insurance	5.51	6.42	-0.91
Auxiliary finance	17.67	14.79	2.88
Real estate	10.80	6.70	4.10
Renting of machinery	10.62	8.30	2.32
Computers	14.75	9.55	5.20
R&D	11.12	7.57	3.55
Other	12.09	8.09	4.00
All	**8.68**	**7.61**	**1.07**

Table 3. Summary Statistics of the Main Independent Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Market access	1816	5.048	1.870	1.204	10.175
Government expenditure	1816	45.6	0.055	0.336	0.581
Government revenue	1816	44.5	0.064	0.347	0.589
Government consumption	1816	20.7	0.029	0.151	0.273
Government investment	1816	13.9	0.036	0.034	0.219
Top marginal income tax rate	1816	45.0	0.083	0.190	0.606
Top statutory corporate tax rate	1816	30.5	0.056	0.175	0.413

Notes: Market access values are reported in logarithms. Government expenditure, revenue, consumption and investment are reported as a percentage share of GDP. The top marginal income tax rate and top statutory corporate tax rate are reported as the tax rate applied to income at the top marginal income tax rate and on corporate profits respectively.

Table 4: Baseline Regressions

Regression No.	**1**	**2**	**3**	**4**	**5**	**6**
Entrepreneurship Indicator	**Entry Rate**	**Exit Rate**	**Entry Rate**	**Exit Rate**	**Entry Rate**	**Exit Rate**
Market Access						
Long run effect	-0.005	0.028	-0.001	0.025	-0.006	0.031
	(0.22)	(1.17)	(0.06)	(1.04)	(0.29)	(1.31)
Short run effect						
	0.565**	-0.550**	0.550**	-0.576**	0.580**	-0.558**
	(3.48)	(3.05)	(3.38)	(3.19)	(3.57)	(3.10)
Interaction variable	*Profitability*	*Profitability*	*Human capital*	*Human capital*	*ICT intensity*	*ICT intensity*
x ΔGovt Expenditure						
Long run effect	-0.032*	0.041**	-0.018	0.000	-0.012+	0.018*
	(2.42)	(2.78)	(1.61)	(0.00)	(1.71)	(2.35)
Short run effect	0.009	-0.021	-0.023	-0.040+	0.000	-0.022
	(0.34)	(0.74)	(1.09)	(1.74)	(0.03)	(1.47)
x ΔGovt Revenue						
Long run effect	0.031**	-0.045**	0.024*	-0.016	0.009	-0.019**
	(2.69)	(3.47)	(2.51)	(1.50)	(1.63)	(2.98)
Short run effect	-0.015	-0.05	0.02	0.029	-0.031	0.000
	(0.37)	(1.12)	(0.61)	(0.78)	(1.48)	(0.01)
Lagged entry						
	-0.407**	0.317**	0.407**	0.319**	-0.404**	0.315**
	(22.53)	(14.77)	(22.41)	(14.80)	(22.42)	(14.73)
Lagged exit						
	0.250**	-0.586**	0.248**	0.588**	0.249**	-0.586**
	(11.30)	(27.84)	(11.20)	(27.84)	(11.21)	(27.80)
Change in exit		0.383**		0.376**		0.379**
		(15.15)		(14.83)		(15.00)
Change in entry	0.312**		0.305**		0.309**	
	(15.15)		(14.83)		(15.00)	
Observations	0.43	0.53	0.43	0.53	0.42	0.53
R-squared	1804	1804	1804	1804	1804	1804

Notes: +, *, ** denote significance at the 10%, 5% and 1% levels respectively. Robust z-statistics included in parentheses. All regressions include country-time and 2-digit industry dummies. All regressions are estimated using an FGLS estimator.

Table 5: Robustness of the relationship between entrepreneurship and globalisation to alternative measures of market access

Regression No.		**1**	**2**	**3**	**4**
Entrepreneurship Indicator		**Entry Rate**	**Exit Rate**	**Entry Rate**	**Exit Rate**
Estimator					
Market Access	*Long*				
run effect		0.014	-0.009	-0.011	0.015
		(0.39)	(0.23)	(0.60)	(0.77)
	Short run effect	0.644**	-0.503*	0.553**	-0.512**
		(3.57)	(2.51)	(3.46)	(2.88)
Profitability x					
Δ *Govt Expenditure*					
	Long run effect	-0.031*	0.040**	-0.032*	0.040**
		(2.39)	(2.76)	(2.42)	(2.76)
	Short run effect	0.009	-0.021	0.01	-0.023
		(0.33)	(0.72)	(0.38)	(0.78)
Δ *Govt Revenue*					
	Long run effect	0.031**	-0.044**	0.032**	-0.045**
		(2.64)	(3.41)	(2.71)	(3.46)
	Short run effect	-0.014	-0.051	-0.015	-0.051
		(0.36)	(1.16)	(0.36)	(1.15)
Observations		0.43	0.53	0.43	0.53
R-Squared		1804	1804	1804	1804

Notes: +, *, ** denote significance at the 10%, 5% and 1% levels respectively. Robust z-statistics included in parentheses. All regressions include country-time and 2-digit industry dummies. All regressions are estimated using a FGLS estimator. Columns 1 and 2 use a measure of market access that imposes a value of distance equal to -1 in both the manufacturing and service sector. In columns 3 and 4 we impose a value of distance equal to -2 in the retail and wholesale trade and hotels and restaurants sectors to reflect their non-traded nature while in the remaining sectors we allow the effect of distance to vary across manufacturing and service sectors as in Table 4.

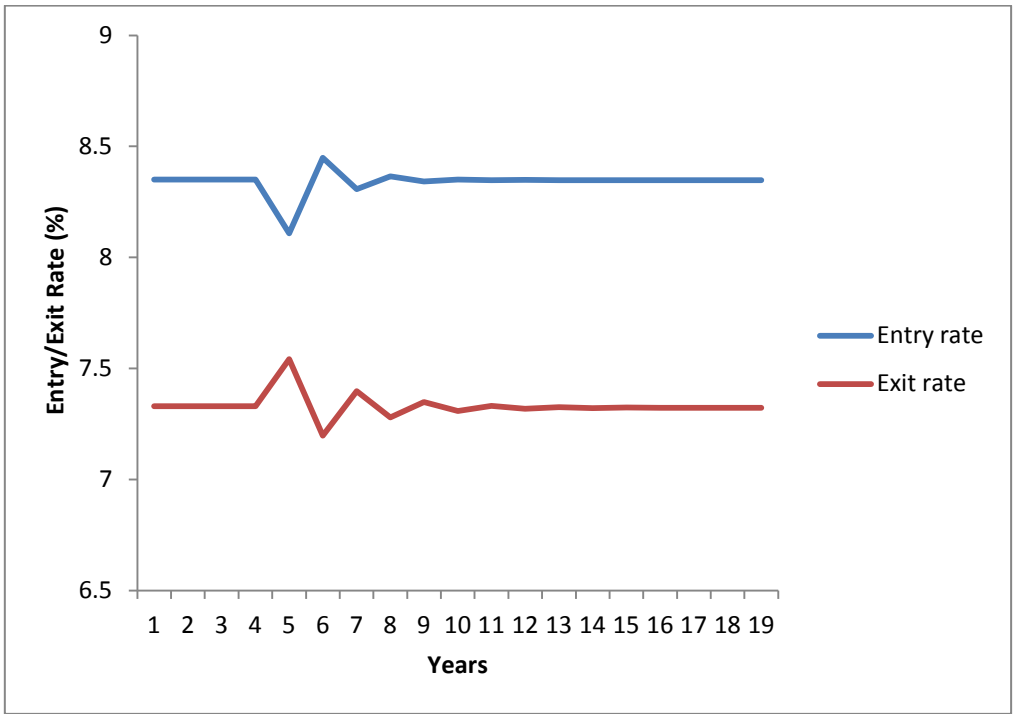
Table 6: Disaggregation of Fiscal Expenditure Variables

Regression No.	**1**	**2**	**3**	**4**	**5**	**6**
Entrepreneurship Indicator	**Entry Rate**	**Exit Rate**	**Entry Rate**	**Exit Rate**	**Entry Rate**	**Exit Rate**
Market Access						
Long run effect	-0.007	0.032	0.000	0.021	-0.003	0.027
	(0.31)	(1.35)	(0.01)	(0.89)	(0.12)	(1.14)
Short run effect	0.590**	-0.566**	0.542**	-0.561**	0.584**	-0.566**
	(3.64)	(3.14)	(3.35)	(3.11)	(3.58)	(3.13)
Interaction variable	*Profitability*	*Profitability*	*Human capital*	*Human capital*	*ICT intensity*	*ICT intensity*
x ΔGovt Consumption						
Long run effect	-0.042*	0.064**	-0.051**	0.042*	-0.017+	0.033**
	(2.37)	(3.25)	(3.31)	(2.42)	(1.82)	(3.10)
Short run effect	-0.013	0.013	-0.027	0.04	-0.049	0.007
	(0.17)	(0.15)	(0.45)	(0.60)	(1.29)	(0.17)
x ΔGovt Investment						
Long run effect	0.011	-0.039*	0.026*	-0.024+	0.007	-0.019*
	(0.79)	(2.50)	(2.22)	(1.89)	(0.98)	(2.55)
Short run effect	0.023	-0.011	-0.02	-0.032	0.001	-0.025+
	(0.99)	(0.41)	(1.05)	(1.50)	(0.09)	(1.85)
x ΔIncome Tax Rate						
Long run effect	0.024**	-0.026**	0.021**	-0.017*	0.005	-0.009*
	(3.11)	(3.01)	(3.42)	(2.43)	(1.28)	(2.10)
Short run effect	0.023	-0.002	-0.017	0.014	-0.014	-0.019+
	(1.17)	(0.08)	(1.07)	(0.80)	(1.46)	(1.71)
x ΔCorporate Tax Rate						
Long run	-0.011	0.021*	-0.019*	0.020*	-0.003	0.009+

effect						
	(1.31)	(2.19)	(2.47)	(2.34)	(0.65)	(1.66)
Short run effect	-0.135**	0.033	0.026	-0.052	0.018	0.025
	(2.90)	(0.63)	(0.66)	(1.19)	(0.79)	(0.95)
Lagged entry	-0.405**	0.316**	-0.419**	0.334**	-0.406**	0.316**
	(22.46)	(14.75)	(22.80)	(15.22)	(22.35)	(14.68)
Lagged exit	0.252**	-0.591**	0.262**	-0.597**	0.250**	-0.594**
	(11.39)	(28.07)	(11.79)	(28.11)	(11.20)	(28.01)
Change in exit		0.382**		0.390**		0.373**
		(15.08)		(15.37)		(14.75)
Change in entry	0.310**		0.315**		0.304**	
	(15.08)		(15.37)		(14.75)	
Observations	0.43	0.53	0.43	0.53	0.43	0.53
R-squared	1804	1804	1804	1804	1804	1804

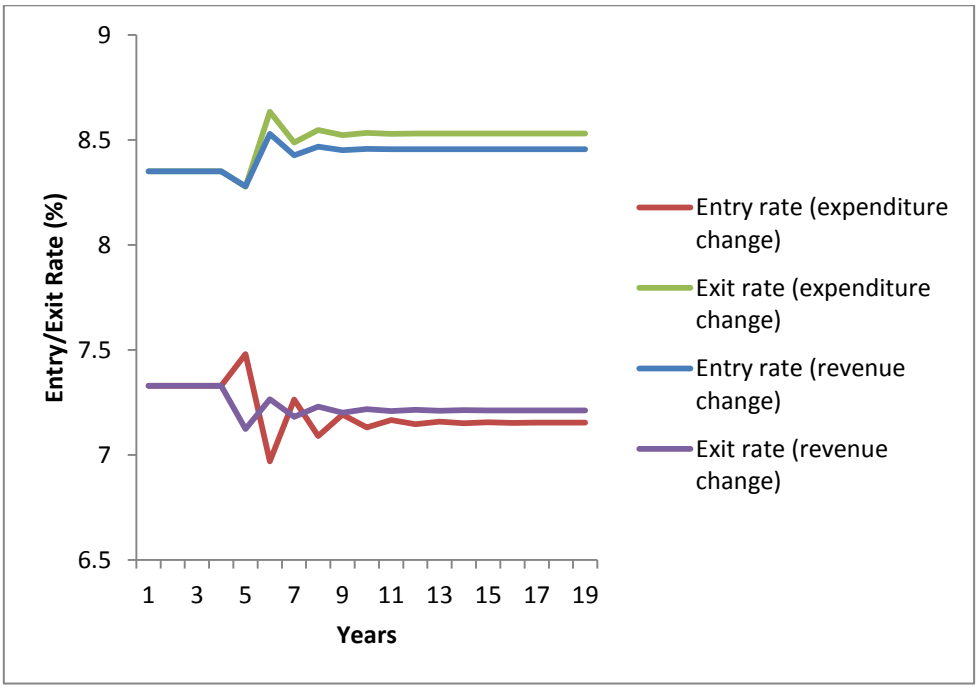
Notes: +, *, ** denote significance at the 10%, 5% and 1% levels respectively. Robust z-statistics included in parentheses. All regressions include country-time and 2-digit industry dummies. All regressions are estimated using an FGLS estimator.

Figure 1: Estimated effect of a one standard deviation decrease in market access



Notes: Based on the parameter estimates from regressions 1 and 2 in Table 4. A one standard deviation change in market access is equal to 0.052 log points. Shock begins in year 4 and represents a permanent decrease in market access.

Figure 2: Estimated effect of a one standard deviation decrease in government expenditure



Notes: Based on the parameter estimates from regressions 1 and 2 of Table 4. Shock begins in year 4 and represents a permanent reduction in government expenditure and an increase in

government revenues equal to the within standard deviation (s.d. government expenditure*profitability = 0.965., s.d. government revenues*profitability = 0.570).

Appendix

Table A1. Coverage of Entry-Exit Data by Data Source

Industry	**Manufacturing**		**Services**
Data Source	**OECD SDBS**	**E.Stat FEED**	**OECD SDBS**
Belgium	98-99		98-99
Czech Republic	01-04	01-04	01-04
Estonia		00-05	
Finland	98-04	98-04	98-04
France	03-05	03-05	03-05
Germany	03-05		03-05
Hungary	00-04	00-05	00-04
Italy	98-04	98-05	98-04
Luxembourg	98-04	98-04	98-04
Netherlands	00-04	99-04	00-04
Norway	99-01		99-01
Portugal	98-04	98-05	98-04
Slovakia	00-04	00-04	00-04
Slovenia	00-04	00-05	00-04
Spain	98-05	98-05	98-05
Sweden	98-05	98-05	98-05
United Kingdom	98-05	98-05	98-05

Notes: *OECD SDBS* refers to the OECD Structural and Demographic Business Statistics Database and *E.Stat FEED* to the Eurostat Firm Exit and Entry Data Dimensions. Manufacturing refers to SIC codes 15-36 and services to SIC codes 50-74.