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ENTRY AND EXIT DYNAMICS OF ‘EXCESSIVE DEFICITS‘ IN THE EUROPEAN UNION

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Abstract

The *extent* of government deficits and debt has been one of the most debated issues in recent years. However, very little has been contributed about their *dynamics*. Yet, the issue of entering into and exiting from excessive deficits will be critical in the European monetary union since the Stability and Growth Pact rules out deficits larger than 3 percent of GDP, except under strictly defined unusual conditions. This paper provides a transition data analysis of the dynamics of public deficits. It shows the asymmetric role played by the economic determinants in theses dynamics and estimates the evolution of the probability of entering into and exiting from excessive deficits for each one of the member states of the European Union since 1970. It also reveals how the concurrence of some minor changes may produce a major switchover in public finance outcomes. Finally, it points to the fragility of some countries even if they are now out of excessive deficits.

Keywords: Fiscal policy, European Monetary Union, Duration Models

JEL Classification: C41, E6, H6, H87

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NON-TECHNICAL SUMMARY

Fiscal discipline and fiscal restructuring have been one of the most debated issues in recent years, more particularly in relation to the European monetary union (EMU) process and to the balanced-budget rule in the US. However, the debate has, until now, focused on the *magnitude* of government deficits and debt. An important issue is still largely unexplored: the *dynamics* of deficits.

The dynamics of government deficits will be of utmost importance in the monetary union because the European Stability and Growth Pact, which will guide fiscal discipline among the member states after the introduction of the euro on January 1, 1999, explicitly rules out deficits above 3 percent of GDP, except under precisely defined unusual circumstances. Since the Stability Pact establishes a legal definition of excessive deficit that the member states should avoid, it is important to examine *the entry and exit dynamics* of excessive deficits. How do countries enter into deficits qualified as being excessive, or, if a country has excessive deficits, how does it exit from such a situation? What are the risks of entry and exit for different member states?

The paper shows that the influence of the debt stock (lagged by one year) on the dynamics of excessive deficits is quite low. Its impact on the hazard rate is –5.1 percent for exits and 5.6 percent for entries.

Government receipts play similar roles in the exit and entry dynamics, whereas the effects of public expenditures are significantly different in the entries and exits. An increase of one point in the government receipts-to-GDP ratio increases the exit rate from excessive deficits by 47.5 percent, and decreases the entry risk by 48.2 percent. An increase by one percentage point in the primary expenditure-to-GDP ratio decreases the exit rate by 25.5 percent, but increases the entry rate by 100 percent! This means that, in the monetary union, the focus should be on the expenditure side in order to prevent any entry into excessive deficits.

Economic growth also plays an asymmetric role in the entry and exit dynamics. An increase by one point in the growth rate decreases the entry rate by 28.1 percent, but it increases the exit rate by 46.3 percent if the country is in excessive deficit.

The following conclusions emerge from the study:

- Government receipts and economic growth play a capital role in the exits, whereas for the entries into excessive deficits the dominant role is played by the primary expenditures. This implies that even if growth and government receipts play a major role in exiting, fiscal policy should then take over and keep a strong control over expenditures to secure a lasting budgetary consolidation.

- In the monetary union the focus should be on the expenditure side in order to prevent any entry into excessive deficits.

- Small but simultaneous changes in the economic situation and government policy may induce important changes in the state of public finances.

- Even if all the Member States with the exception of Greece are now in a non-excessive deficit situation, the evolution of entry and exit probabilities since 1971 shows that some countries (Belgium, Greece, and Italy certainly, but also, though in a smaller extent, many of the other Member States) will still be in a fragile position in the near future.

1. Introduction

Fiscal discipline and fiscal restructuring have been one of the most debated issues in recent years, more particularly in relation to the European monetary union (EMU) process and to the balanced-budget rule in the US. Three major questions have been at the heart of this debate:

— If discretion in policy making may lead to high public deficits and debt, should policymakers be subject to strict fiscal constraints? What are the costs and benefits of fiscal rules?

— What role do economic, political and institutional variables and processes play in the public finance outcomes?

— What are the macroeconomic effects of fiscal adjustments?

A growing theoretical and empirical literature is devoted to the analysis of these questions. Buiter et al. (1993) and Roubini (1995) examine the relevance of fiscal constraints and claim that rigid fiscal rules deprive the policy maker of an important tool to stabilize output and smooth tax distortions over time. Roubini and Sachs (1989), Grilli et al. (1991), Alesina and Perotti (1995), and Alesina and Perotti (1996) show the importance of political and institutional factors in public finance outcomes. von Hagen (1992), Alesina and Perotti (1996a and 1996b), and Poterba (1996) consider the role of institutions and procedures involved in the process of preparing and approving the budget. Corsetti and Roubini (1996) compare the European and American fiscal rules. Poterba (1996), Bohn and Inman (1996), and Ahmed (1996) discuss the effectiveness of balanced-budget rules in the US states. Bartolini et al.

(1995), Bayar et al. (1997), Hallett and Adam (1997), and Cour et al. (1996) evaluate the macroeconomic impacts of fiscal adjustments and rules using econometric models. Alesina and Bayoumi (1996), and Bayoumi and Eichengreen (1995) explore the implications of fiscal rules on economic stabilization. Bertola and Drazen (1993), Giavazzi and Pagano (1990 and 1995), Barry and Devereux (1995), McDermott and Wescott (1995) discuss whether contractionary policies may have expansionary effects. Alesina and Perotti (1995 and 1997), and Perotti (1996) show that the composition of fiscal consolidation matters for the success of fiscal adjustments. Heylen (1997) discusses the effectiveness of fiscal consolidation policies in 19 OECD countries since the mid-1970s.

The recent macroeconomic literature on fiscal policy is remarkably rich and provides a much better understanding of the determinants of public deficits. However, the debate has, until now, focused on the *magnitude* of government deficits and debt. An important issue is still largely unexplored[2]: the *dynamics* of deficits.

The dynamics of government deficits will be of utmost importance in the monetary union because the European Stability and Growth Pact[3], which will guide fiscal discipline among the member states after the introduction of the euro on January 1, 1999, explicitly rules out deficits above 3 percent of GDP, except under precisely defined unusual circumstances. Since the Stability Pact establishes a legal definition of excessive deficit[4] that the member states should avoid, it is important to examine *the entry and exit dynamics* of excessive deficits. How do countries enter into deficits qualified as being excessive, or, if a country has excessive deficits, how does it exit from such a situation? What are the risks of entry and exit for different member states? These questions are essential for the European monetary union because the member countries will lose the exchange rate as a macroeconomic adjustment

[2] An exception is the recent study by Buti et al. (1997).

[3] The Stability and Growth Pact defines precisely under which conditions and following which steps the Excessive Deficit Procedure will be launched against a member state which does not comply with the ceiling of 3 percent of deficit to GDP ratio. The Pact also states that in the medium run the budget should be close to balance or in surplus so that the deficit to GDP ceiling of 3 percent can even be observed under unfavorable economic situations.

[4] In this paper I use the term 'excessive deficit' in its legal sense established by the Stability and Growth Pact, and not in any economic meaning. It is clear that there is no economic standard to know whether a given deficit is excessive or not. Following the threshold laid-out by the Stability Pact, in this paper, deficits above three percent of GDP are classified as being 'excessive'.

mechanism and will have to rely on fiscal instruments[5]. The dynamics of excessive deficits and its determinants are therefore a vital issue.

The objective of this paper is to provide a transition data analysis (Lancaster, 1990) of the dynamics of budget deficits in the 15 member countries of the European Union. The econometric methods of transition data analysis are particularly well suited for this issue because, here, we are concerned both with the duration of a state[6] and the destination[7] that is entered at its end. Transition data refers not only to how long a state lasts but also what happens when it ends.

Using data for the period 1970-1996, in this paper I examine the economic determinants of entry and exit dynamics of excessive deficits and estimate the hazard rates for each one of the member states. The remainder of the paper is organized as follows. The transition model is presented in section 2. Section 3 provides the econometric results. Section 4 concludes.

2. A Transition Model

The evolution of nominal government deficits (*DEF*) can be expressed by the accounting relation

$$DEF_t = D_t - D_{t-1} = E_t + iD_{t-1} - TAX_t \qquad (1)$$

where D is the stock of public debt, E is government primary expenditure, i is the nominal interest rate on the debt and TAX is total revenues.

Expressing the nominal deficit in terms of GDP gives

[5] As well as on wage and price changes.
[6] Being in or not being in a state of excessive deficit.
[7] Excessive or non-excessive deficit states.

$$\frac{DEF_t}{Y_t} = \frac{E_t}{Y_t} + \frac{1}{(1+g)(1+\pi)} \frac{iD_{t-1}}{Y_{t-1}} - \frac{TAX_t}{Y_t} \tag{2}$$

where Y is GDP, g is the growth rate of real GDP, and π is the inflation rate.

Equation (2) clearly shows that the deficit-to-GDP ratio increases with government spending, nominal interest rate and debt stock, whereas it decreases with the growth rate, the inflation rate and government revenue. Equation (2) can be used to analyze how various economic variables determine the evolution of the deficit-to-GDP ratio.

One of the critical questions which arise with the criterion of 3 percent of the Maastricht Treaty and the Stability and Growth Pact is how the deficit-to-GDP ratio evolves with respect to this threshold of 3 percent. In order to examine this question let us define two states s_1 and s_2 for the deficit-to-GDP ratio. s_i is a discrete binary variable: the state of being in excessive deficit (deficit-to-GDP ratio > 0.03) and the state of not being in excessive deficit (deficit-to-GDP ratio ≤ 0.03). Now, the question is: How do countries enter into and exit from such states? What are the effects of various economic variables on these entry and exit dynamics?

Let us think of time to exit the state s_i as a continuous random variable T. T can be considered as the duration of stay in the state s_i if we set the clock to zero at the moment a country enters into the state in question. Then, the probability of exiting the state s_i in the time interval from t to t, given that the country has been in that state up to time t, can be defined as:

$$P_i\left(t \le T < t' \middle| T \ge t\right) \quad t < t' \tag{3}$$

This is the probability that an event (entry or exit) occurs in the time interval from t to t, given that no event (transition) has occurred before in the interval from 0 to t. The definition refers to each point in time and can therefore describe the temporal evolution of the process.

If we divide this probability by *t'-t*, we get the average probability of leaving per unit time period over a short interval after *t*. By considering this average over shorter and shorter intervals we get the hazard function $h_i(t)$ of dynamics for state s_i

$$h_i(t) = \lim_{t' \to t} \frac{P_i\left(t \leq T < t' \middle| T \geq t\right)}{t' - t} \tag{4}$$

The interpretation of the hazard function is that $h_i(t)(t-t)$ is approximately the probability of exit from the state s_i in the short interval after *t*, given that the country has still been in state s_i at *t*. We can also interpret $h_i(t)$ as the propensity to change the state, from the origin state *j* to the destination state *k*, at *t*. But it should be kept in mind that this propensity is defined in relation to the risk set at time *t*, i.e. the set of countries which are still in the origin state *j*.

We can express the hazard function in terms of the distribution and probability density functions of the random variable *T*. Let the distribution function be

$$F_i(t) = P_i(T < t), \qquad t \geq 0\,. \tag{5}$$

This gives the probability that an event happens (exit from or entry into the excessive deficit state) in the time interval from 0 to *t*. Equally, we can describe the probability distribution of *T* by a survivor function $G_i(t)$:

$$G_i(t) = 1 - F_i(t) = P_i(T \geq t) \tag{6}$$

This is the probability that the spells duration is at least *t*, that the exit from state *j* and entry into state *k* occurs later than *t*.

The distribution of the random variable T can also be described by a density function, $f_i(t)$, which is related to the distribution function by

$$F_i(t) = \int_0^t f_i(u)du \tag{7}$$

Now, we can establish the relationship with the hazard function.
By the law of conditional probability we have

$$P_i(t \leq T < t' | T \geq t) = \frac{P_i(t \leq T < t')}{P_i(T \geq t)}. \tag{8}$$

In terms of the distribution function, this is equivalent to

$$\frac{F_i(t') - F_i(t)}{1 - F_i(t)}. \tag{9}$$

Dividing this expression by t'-t and getting the limit gives the hazard function

$$h_i(t) = \lim_{t' \to t} \frac{1}{t' - t} \frac{F_i(t') - F_i(t)}{1 - F_i(t)} = \frac{f_i(t)}{G_i(t)}. \tag{10}$$

This shows that the hazard function is a conditional density function, i.e. the density function divided by the survivor function. So, the hazard function allows for a local description of the development of a process. In order to calculate $h_i(t)$ we need information on the local probability density for events (exit from or entry into excessive deficits) at t, given by $f_i(t)$, and on the process up to t, given by $G_i(t)$.

Since $f_i(t) = -dG_i(t)/dt$, equation (10) is a differential equation in t whose solution, subject to the initial condition $G_i(0)$=1, is

$$G_i(t) = \exp\left(-\int_0^t h_i(u)du\right) \tag{11}$$

The relation between the hazard rate and the survivor function can also be expressed by

$$h_i(t) = -\frac{d\log G_i(t)}{dt}. \tag{12}$$

Thus, *h*, *f*, and *G* are alternative ways of describing the distribution of the probability of exit from or entry into a state; if we know one, we can deduce the others.

Now, having defined the hazard functions for the states s_i, we have to evaluate the transition rates between the states and the effects of the relevant economic variables on these rates. The models[8] to be estimated can be written as

$$h_i(t, X_i, \alpha_i, \beta_i) = h_{oi}(t, \alpha_i)e^{X_i(t)\beta_i} \tag{13}$$

where $h_{oi}(t,\alpha)$ is the baseline hazard function with parameter α_i and X_i is a row-vector of covariates associated with the coefficients β_i.

It is impossible to establish the shape of the hazard function h_i of excessive and non-excessive deficits on any theoretical grounds. Therefore, in order to estimate the effects of the relevant economic variables on the hazard rates it is preferable to use the Cox model. Unlike the parametric hazard models, Cox's method does not require any prior choice of a particular probability distribution to represent the survival times. As a consequence, Cox's semiparametric method is considerably more robust.

The initial approach proposed by Cox (1972) is commonly referred to as the proportional hazard model. That name is nevertheless misleading, because the model can be generalized to allow for nonproportional hazards, which is the case with our

[8] Two models are estimated: one for the transition from excessive to non-excessive deficits, and one for the transition in the other direction.

model. Given that this model incorporates time-dependent covariates[9] which change at different rates for different countries, the model is no longer proportional and the baseline hazard cannot be derived from the estimated Cox model. It is therefore necessary to estimate a parametric model in order to calculate the hazard function for the different constellation of covariates for the different countries. The most attractive specification for this is the complementary log-log function[10] for grouped durations[11] which provide *identical* estimates as the Cox model for the effects of the covariates on the hazard rate. To see this, lets begin with the equations 11 and 13 for the survivor and hazard functions for continuous time models. Given that we have annual data, we only observe whether or not an event[12] ε_i occurred between time *t-1* and *t*. This probability is one minus the probability of surviving[13] beyond *t* given survival up to *t-1*.

Denote

$$E_i = \begin{cases} 1, \text{ if the event } \varepsilon_i \text{ occurs} \\ 0, \text{ if the event } \varepsilon_i \text{ does not occur} \end{cases} \tag{14}$$

Given the observed history H_{t-1} corresponding to the spell up to time *t-1* in the follow-up, the conditional probability P_i that the considered event occurs during the time interval *t-1* and *t* granted that no prior event ε_i has occurred during the spell until *t-1* can be expressed as

$$P_i \left\{ E_i(t) = 1 \middle| E_i = 0 \text{ during } H_{i,t-1} \right\} = 1 - G_i(t)/G_i(t-1) \tag{15}$$

Using equations 11 and 13, we get

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[9] In this paper, time-variant regressors are introduced using the spell splitting technique. The model is estimated using partial likelihood procedures, taking into account all the censored and uncensored spells.
[10] The complementary log-log function does not provide the continuous hazard rate, but, in our case, this is not a problem given that it does provide the conditional probabilities of entry and exits for time intervals. This information is sufficient for our analysis.
[11] Grouped duration data allows for exits or entries at any time, but given the discrete measurement process we only observe whether an exit or an entry have occurred in some time interval.
[12] We have two events: entry into or exit from excessive deficit.
[13] Given by the equations 6 and 11.

$$P_i\left\{E_i(t)=1 \middle| E_i=0 \,\text{during}\, H_{i,t-1}\right\}=1-\exp\left\{-\exp\{X_i(t)\beta_i\}\int_{t-1}^{t} h_{oi}(u)du\right\} \quad (16)$$

Since the baseline hazard h_{oi} is unspecified, we can treat the integral of h_{oi} as an unknown constant. Defining

$$\lambda_i(t)=\log\int_{t-1}^{t} h_{oi}(u)du \quad (17)$$

we get the complementary log-log function

$$P_i\left\{E_i(t)=1 \middle| E_i=0 \,\text{during}\, H_{i,t-1}\right\}=1-\exp\left[-\exp\{\lambda_i(t)+X_i(t)\beta_i\}\right] \quad (18)$$

which provides estimates of β_i that are *identical* to those of the Cox model for grouped data and at the same time estimates of the conditional probabilities P_i for entries into and exits from excessive deficits.

I have also tested with the piecewise complementary log-log model, but the results show that there are no significant differences in the baseline hazards in different time periods between 1970 and 1996. This suggests that there is no duration dependence and that the baseline hazard does not significantly change autonomously over time – any changes must occur in response to changes in the explanatory variables. However, even if the baseline hazard rate is time-invariant over the whole estimation period, the actual transition rate from the origin state *j* to the destination state *k* varies with different constellations of covariates in time. In other words, the transition rates are country and time specific.

3. Results

Two models are estimated for exits from and entries into excessive deficits using data for the period 1970-1996 for all the fifteen member states of the EU. The following economic covariates are considered:

DEBTL	Debt-to-GDP ratio, lagged by one year
EXPEND	Government primary expenditure-to-GDP ratio
RECEIPT	Government receipts-to-GDP ratio
GROWTH	Growth rate
REALINL	Real long-term interest rate, lagged by one year

Tables 1 and 2 provide the coefficient estimates for the complementary log-log function[14]. The likelihood-ratio chi-square statistics show that the global null hypothesis[15] is rejected for both models. This means that at least one of the coefficients is significantly different from 0. We observe that the coefficient for the real interest rate is not significantly different from zero in both models. The other estimates are highly significant and the signs of the coefficients are what we expect theoretically.

Table 1: Estimates for Exits from Excessive Deficits

Variable	Coefficient	Standard Error	*p*-value	Effect in %
INTERCEPT	-4.3866	1.4557	0.0026	
DEBTL	-0.0524	0.0141	0.0002	-5.1
EXPEND	-0.2939	0.0945	0.0019	-25.5
RECEIPT	0.3888	0.0975	0.0001	47.5
GROWTH	0.3805	0.1319	0.0039	46.3
REALINL	0.0378	0.0744	0.6113	

χ^2 36.652 with 5 DF p-value = 0.0001

Table 2: Estimates for Entries into Excessive Deficits

Variable	Coefficient	Standard Error	*p*-value	Effect in %
INTERCEPT	-3.5551	1.5460	0.0215	
DEBTL	0.0546	0.0153	0.0003	5.6

[14] The estimates for the β_i are identical for the Cox model.
[15] The global null hypothesis is: $\beta_i = 0$ for all i.

EXPEND	0.6928	0.1738	0.0001	99.9
RECEIPT	-0.6586	0.1681	0.0001	-48.2
GROWTH	-0.3294	0.0931	0.0004	-28.1
REALINL	0.0461	0.0648	0.4767	

χ^2 50.269 with 5 DF *p*-value = 0.0001

The numerical magnitudes of the coefficients are not very informative on their own but a simple transformation leads to a very intuitive interpretation. The effects of a covariate can easily be interpreted if we examine the percentage change in the hazard rate when the covariate changes its value by one unit. These effects (in percentage) are given in the last column (*Effect*) of each table.

We observe that the influence of the debt stock (lagged by one year) on the dynamics of excessive deficits is quite low. Its impact on the hazard rate is –5.1 percent for exits and 5.6 percent for entries.

It is interesting to note that government receipts play similar[16] roles in the exit and entry dynamics, whereas the effects of public expenditures are significantly different in the entries and exits. An increase of one point in the government receipts-to-GDP ratio increases the exit rate from excessive deficits by 47.5 percent, and decreases the entry risk by 48.2 percent. An increase by one percentage point in the primary expenditure-to-GDP ratio decreases the exit rate by 25.5 percent, but increases the entry rate by 100 percent! This means that, in the monetary union, the focus should be on the expenditure side in order to prevent any entry into excessive deficits.

Economic growth also plays an asymmetric role in the entry and exit dynamics. An increase by one point in the growth rate decreases the entry rate by 28.1 percent, but it increases the exit rate by 46.3 percent if the country is in excessive deficit.

In summary, government receipts and economic growth play a capital role in the exits, whereas for the entries into excessive deficits the dominant role is played by the primary expenditures. This implies that even if growth and government receipts play a

[16] In absolute terms.

major role in exiting, fiscal policy should then take over and keep a strong control over public expenditures to secure a lasting budgetary consolidation.

It is also important to note that the effects of the covariates are not independent of each other. They are related multiplicatively. For example, all other things being equal, a simultaneous increase in government primary expenditure-to-GDP ratio by two points and a decrease in the growth rate by one point will increase the hazard of entry into excessive deficit by 453 percent:

$$\left[\exp(0.69)^2 \exp(0.33) - 1\right] \cdot 100\% \approx 453\%$$

This implies that some small but simultaneous changes in the economic situation and government policy may induce major changes in the state of public finances.

As we have already seen above, the transition rate from the origin state j to the destination state k varies with different constellations of covariates in time. In other words, the transition rates are country and time specific. Consequently, we can use the different constellations of covariates in time in the different EU countries in order to compute the evolution of the conditional probabilities of transitions in each one of the EU member states.

Table 3 provides the results of these backward simulations for entry into and exit from excessive deficits. The table presents only the average transition rates for various periods. The complete evolution in time between 1971 and 1996 is provided in the appendix. The last two columns of table 3 gives the average exit and entry probabilities computed for mutually exclusive states. For example, a figure in the last column represents the average of the entry probabilities when the country was in a non-excessive deficit situation. Similarly, a figure in the column before the last one represents the average of the exit probabilities when the country was in an excessive deficit situation.

Table 3: Conditional Probabilities (in percentage)

	1971-1989		1990-1996		1996		Split States	
Country	Exit	Entry	Exit	Entry	Exit	Entry	Exit	Entry
Belgium	6.1	93.2	1.5	98.9	1.5	99.8	4.4	52.7
Denmark	75.3	21.0	58.3	26.6	65.6	20.3	38.8	8.2
Germany	41.5	35.4	27.9	56.8	8.5	93.1	21.0	25.9
Greece	16.4	51.2	0.6	96.4	1.4	79.3	0.8	7.5
Spain	22.6	35.5	9.1	74.9	6.0	73.6	7.3	9.6
France	58.0	22.5	26.2	74.1	15.7	94.6	20.1	21.2
Ireland	4.4	80.9	19.2	14.9	34.6	4.4	4.2	14.5
Italy	1.8	98.7	1.0	99.5	8.0	100.0	1.6	100.0
Luxembourg	85.7	9.2	99.5	1.6	99.5	1.4	34.1	4.3
Netherlands	35.9	57.7	15.5	73.6	16.2	49.1	19.5	29.5
Austria	45.6	43.2	18.8	72.6	6.9	99.2	18.5	32.0
Portugal	22.5	36.5	8.3	57.9	7.5	65.8	11.5	3.9
Finland	98.6	0.5	40.3	69.2	71.3	21.6	25.3	5.7
Sweden	85.8	22.8	35.3	72.4	36.5	81.0	34.7	7.0
UK	15.3	47.0	5.6	80.5	5.2	83.6	6.5	23.0

Table 3 and the attached figures clearly show that **Belgium**, **Greece**, **Portugal**, and **Italy** have had very low transition rates out of excessive deficits until 1996. These countries are the ones which may face the excessive deficit procedure in the future because they easily **get stuck** in excessive deficits once they enter into such a situation. This is why it is so important for them to avoid entering into excessive deficits by keeping a strong control on government expenditures.

The probability of entry into excessive deficit has been quite low in **Denmark** (27 percent in average in the 1990s) and has even been decreasing in the recent years.

Excessive deficit spells have relatively been short in **Germany** (maximum two years) in the past. But, the underlying probability of entering into excessive deficits has increased in the 1990s (57 percent in average) and the probability of exiting has decreased (28 percent).

Spain has experienced long excessive deficit spells. The average exit probability has decreased considerably (to 9 percent) in the 1990s.

France has been in a sound situation until 1989. Since then, the probability of entering into excessive deficits has increased and the underlying probability of exiting has decreased. Finally, in 1992 the deficit-to-GDP ratio fell under 3 percent.

Ireland has experienced long excessive deficit episodes in the past. But, the probability of entry into such a situation has fallen to only 15 percent in the 1990s.

Luxembourg is in the best situation. The probability of entering into excessive deficit has been 1.5 percent on average in the 1990s.

The **Netherlands** has experienced long excessive deficit spells in the past. The exit rate has been quite low since 1987. The probability of entry has declined to 49 percent in 1996, but this positive evolution is quite recent.

Excessive deficit episodes have become longer in **Austria**. The probability of entry had been increasing since 1990 and the exit rate had been declining. The deficit-to-GDP ratio finally fell below 3 percent in 1993. The last columns show that on average, Austrias probability of entry into excessive deficit has been much higher than its entry probability since 1971.

The situation of public finance in **Finland** radically changed in 1990. The deficit-to-GDP ratio finally fell below 3 percent in 1992. But, the exit probability increased rapidly and Finland left the excessive deficit situation in 1996.

The deficit-to-GDP ratio has been below 3 percent since 1992 in **Sweden**. The exit rate has been increasing since 1993. This attests a sound evolution. The last columns show that the exit probability has been quite large on average (35 percent) when Sweden was in excessive deficit.

The **United-Kingdom** has experienced long excessive deficit spells and the exit probability has been low (6.5 percent) once the country was in such a situation.

4. Conclusion

The emergence and persistence of large public deficits and debt in many industrial countries in the last two decades has generated a widespread concern that discretion in policy making may lead to excessive deficits. Fiscal discipline has been one of the most debated issues in recent years. However, very little attention has been paid to the dynamics of excessive deficits. This paper is an attempt to contribute to our understanding of the economic determinants of budgetary dynamics. The following conclusions emerge from the study:

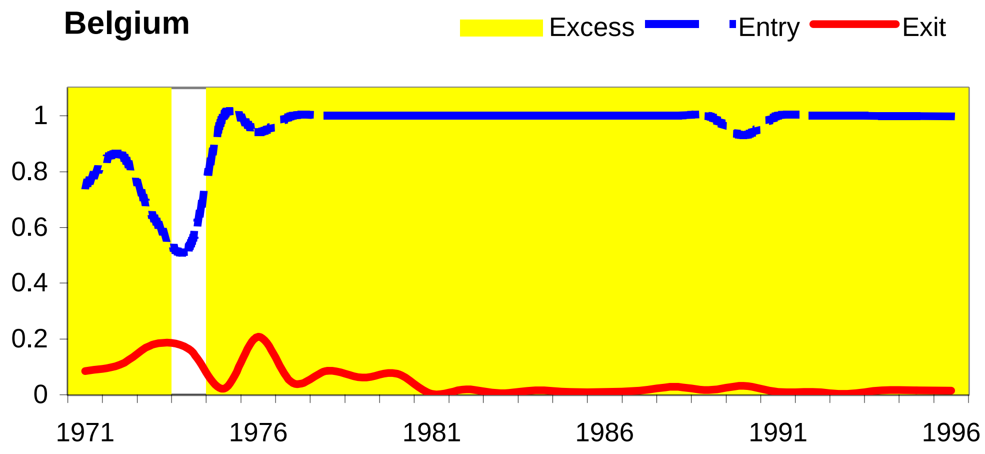
- Government receipts and economic growth play a capital role in the exits, whereas for the entries into excessive deficits the dominant role is played by the primary expenditures. This implies that even if growth and government receipts play a major role in exiting, fiscal policy should then take over and keep a strong control over expenditures to secure a lasting budgetary consolidation.

- In the monetary union the focus should be on the expenditure side in order to prevent any entry into excessive deficits.

- Small but simultaneous changes in the economic situation and government policy may induce important changes in the state of public finances.

- Even if all the Member States with the exception of Greece are now in a non-excessive deficit situation, the evolution of entry and exit probabilities since 1971 shows that some countries (Belgium, Greece, and Italy certainly, but also, though in a smaller extent, many of the other Member States) will still be in a fragile position in the near future.

APPENDIX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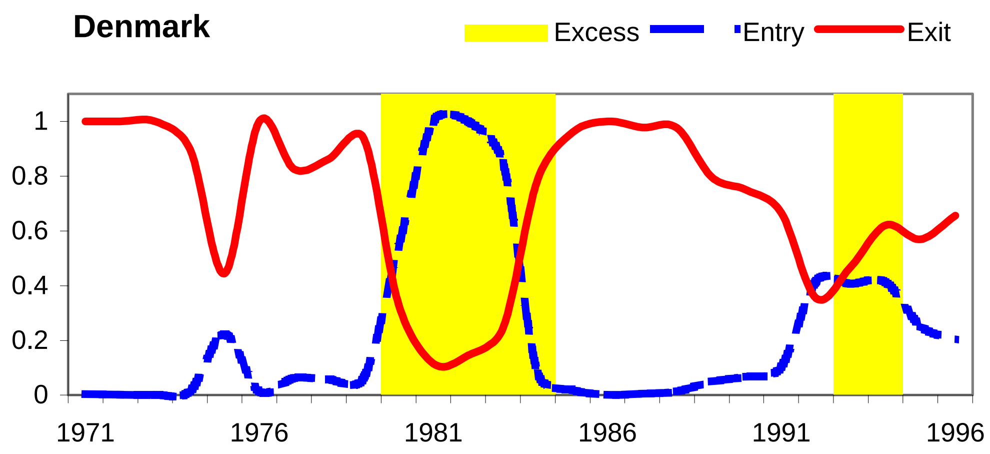
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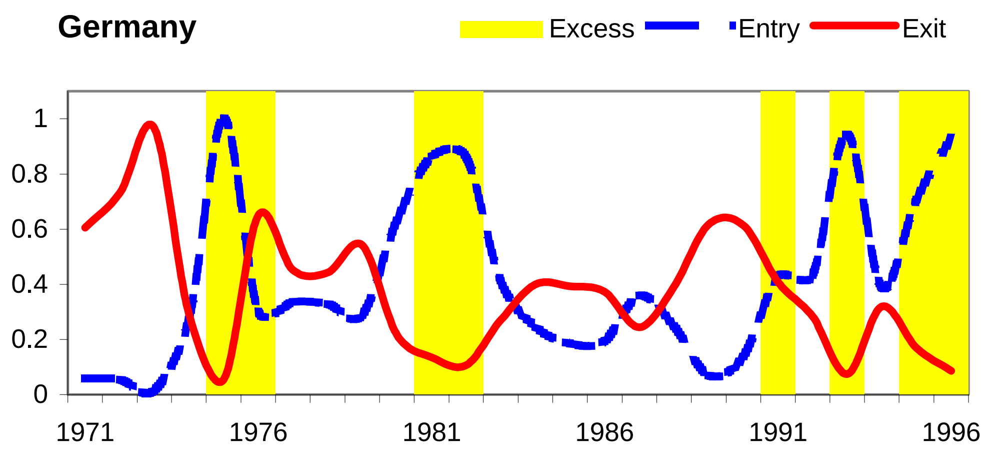
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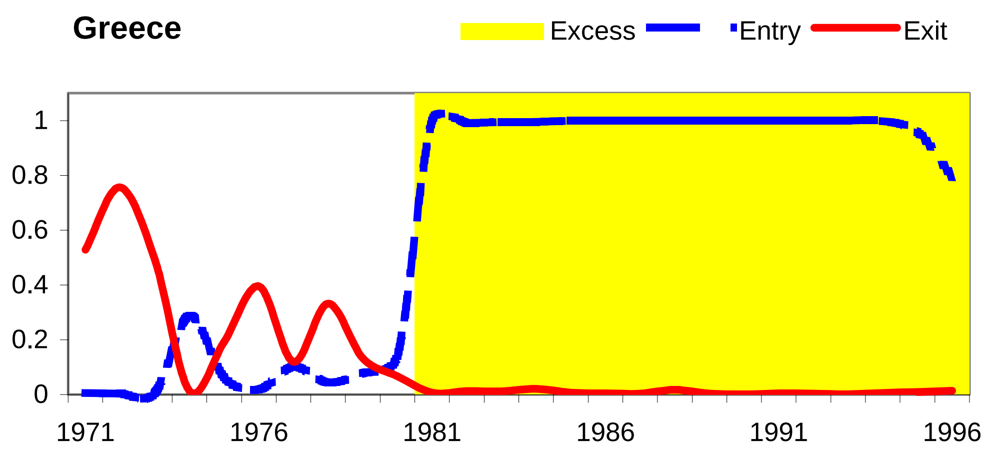
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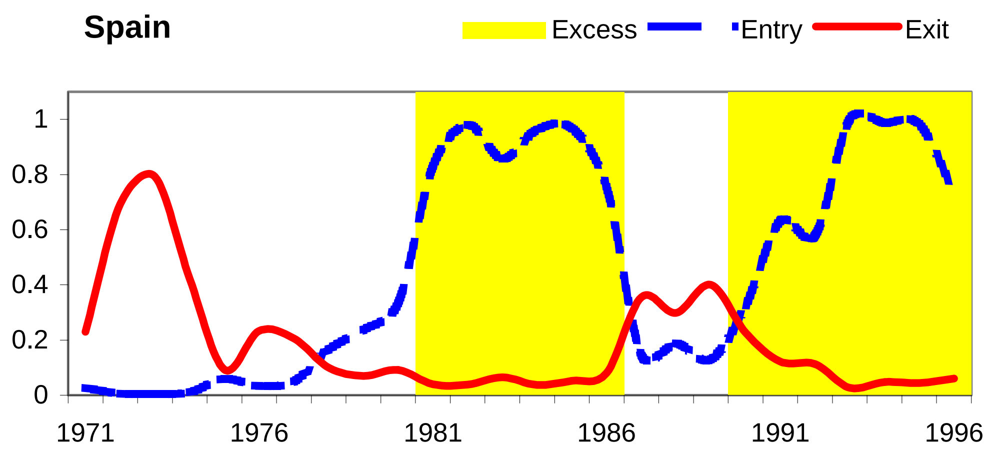
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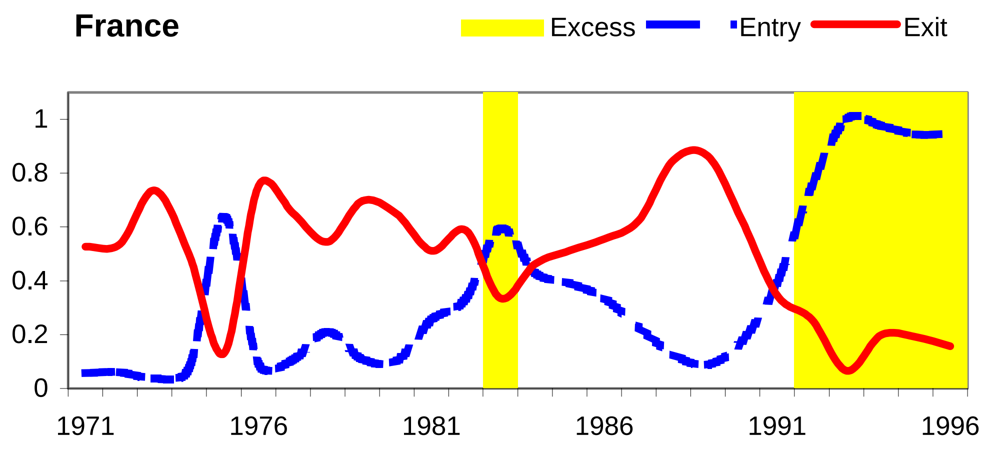
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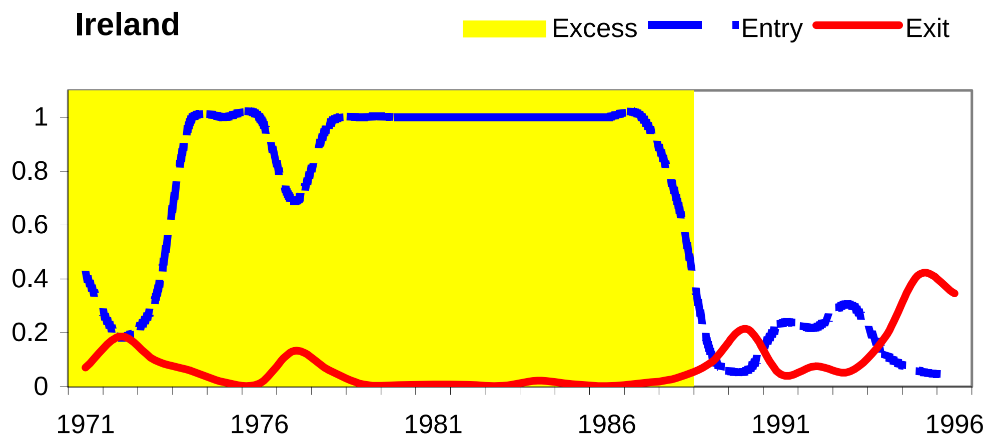
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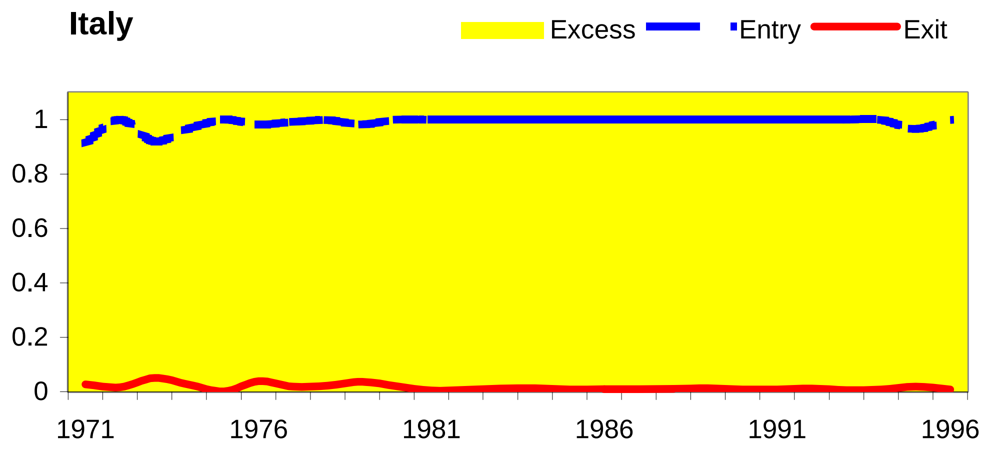
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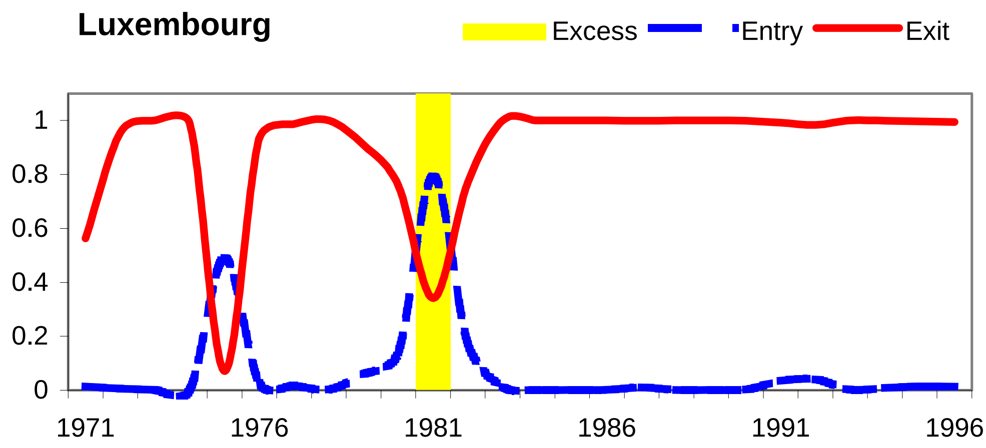
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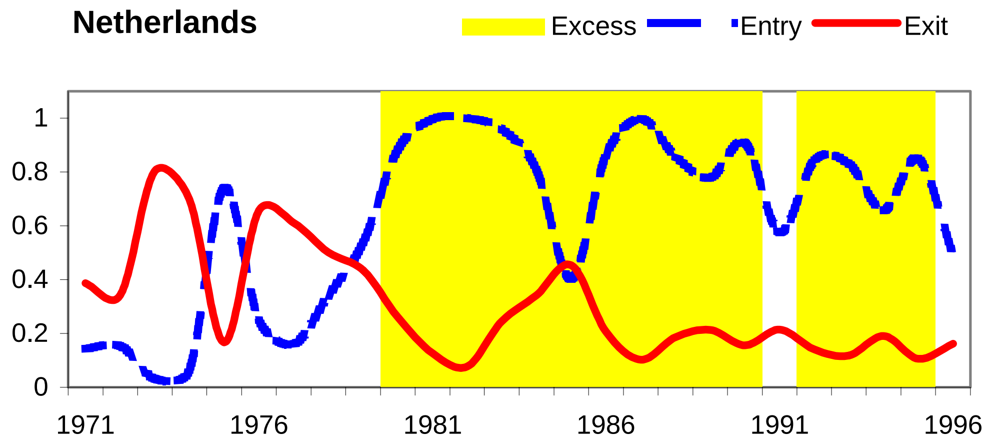
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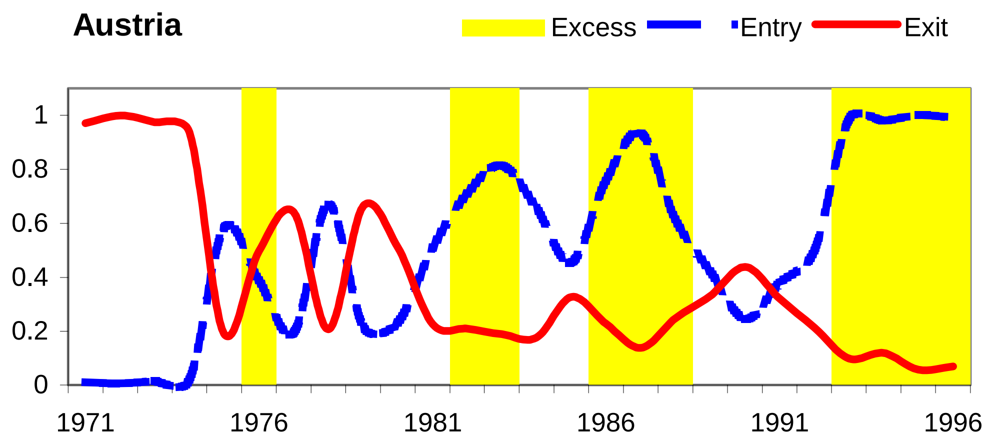
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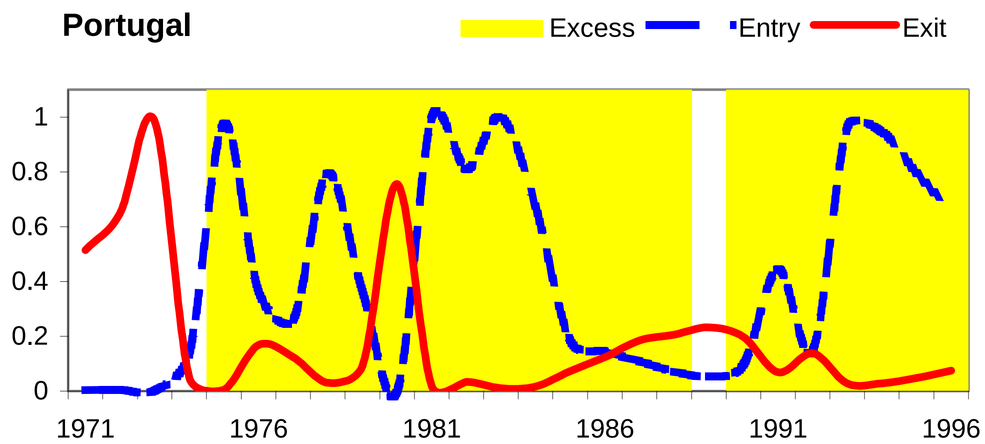
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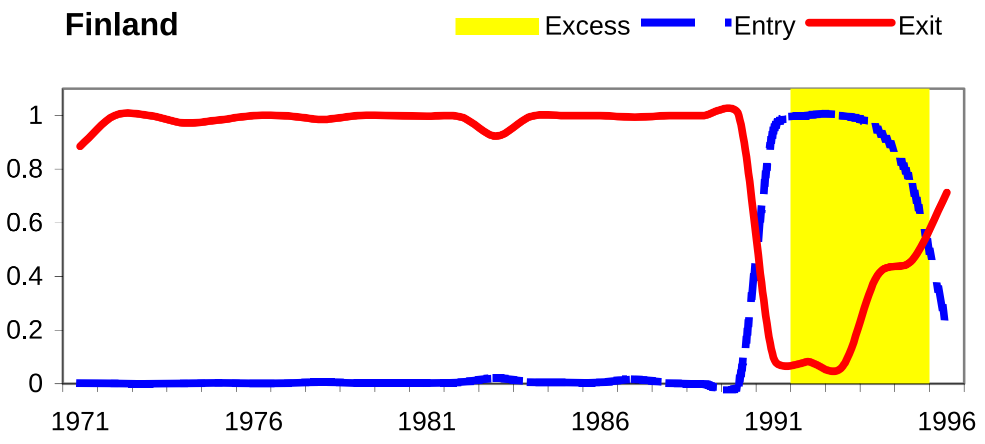
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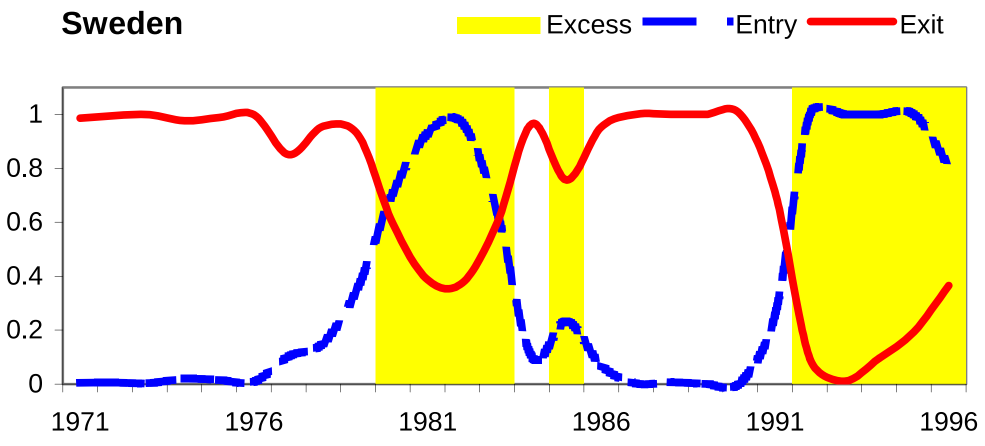
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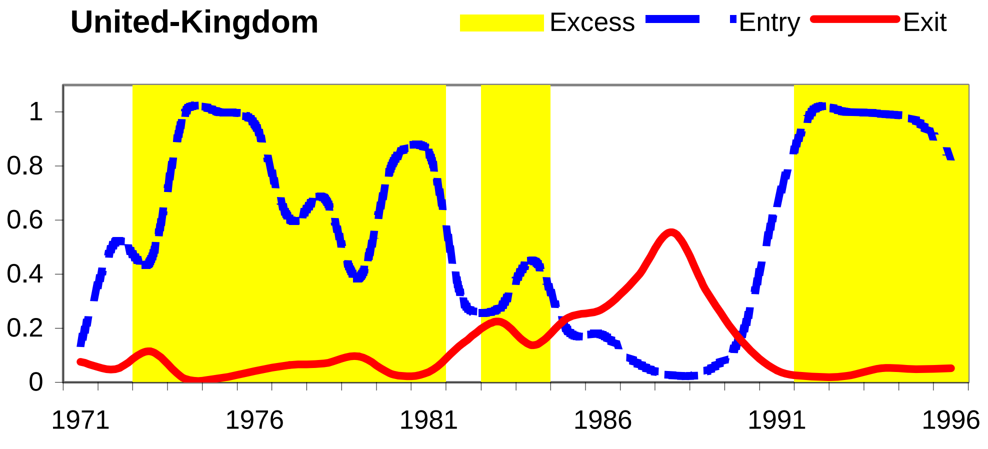
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