

What have the monetary authorities really stabilised, and does it matter?

by

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Abstract

A simple statistical method is used to identify what domestic and external variables the monetary authorities in different countries have succeeded in stabilising, in each year over the period 1974-2017. The findings emphasise the shift over time from exchange rate to domestic variable (mainly price) stabilisations, and from cases where no variable is stabilised on the criteria used and inflation is 5% or higher, to cases where no variable is stabilised but inflation is constrained to be below 5%. The stabilisations identified are also compared with a recent classification of countries' monetary policy frameworks, which has a different approach and different sources: the overlaps are considerable but incomplete. The association between the different stabilisations and economic performance in terms of inflation and growth is then examined, through both unconditional and conditional analyses. The clearest finding is that constrained no overall stabilisation is associated with better performance than unconstrained no overall stabilisation, and typically with as good performance as price stabilisation. It is suggested that good macroeconomic outcomes can be obtained in the context of a variety of stabilisations, provided the monetary authorities are 'serious about inflation'.

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1 Introduction

There has been much discussion in the monetary policy literature about what objectives the monetary authorities should pursue, and about the economic performance associated with the pursuit of different objectives. Much of this goes back to Friedman's (1960) monetary rule, which proposed that the money supply should be made to grow at a constant rate year in and year out, with no regard to conjunctural developments. During the Bretton Woods period most countries pegged (the level of) their exchange rates to the US dollar, and many developing countries still emphasise exchange rate stability. In recent years the most commonly discussed domestic objective has been inflation, and the particular arrangements typically involved in inflation targeting (IT) together with the inflation and growth outcomes of IT have been examined in detail (see, for example, Mishkin and Schmidt-Hebbel, 2007; Walsh, 2009; Schmidt-Hebbel, 2010; Ball, 2010; and Cobham and Song (forthcoming)). There is also a literature focused on alternative exchange rate regimes and their effects (see for example, Ghosh, Gulde and Wolf, 2002; Tavlas, Dellas and Stockman, 2008). The latter research has included work to classify exchange rate regimes, with a focus on what governments do as well as what they claim to be doing, notably by Reinhart and Rogoff (2004; see also Ilzetzki, Reinhart and Rogoff, 2019) and Levy Yeyati and Sturzenegger (2005, 2016). Cobham (2020) offers a comprehensive classification of (domestic as well as external) monetary policy frameworks which takes account of pre-announced targets of different kinds as well as outturns for target variables.

In this paper we ask a simple question: what variable(s) – money, a particular exchange rate, prices, real or nominal income - have the monetary authorities actually stabilised, in a large sample of 'advanced', 'emerging' and developing countries? The answers cannot be taken as indicating the intentions of the monetary authorities, since the monetary authorities' control

may be less than completely effective and the variables concerned are vulnerable to shocks of different kinds which policy may not be able to offset in the short term. But they offer some interesting insights into the way in which intermediate monetary policy outcomes have changed over the period considered, which runs from 1974 (after the upheavals immediately associated with the demise of the Bretton Woods international monetary system) to 2017. We then consider the outcomes for inflation and growth associated with these different 'stabilisations', in order to see whether this offers any guidelines for future policy.

Section 2 sets out the methodology used to identify what variables have been stabilised. Section 3 applies that methodology to 26 'advanced' countries (plus, from 1999, the Euro Area); 33 'emerging' economies; and 110 developing economies.¹ Section 4 compares the stabilisations identified with the classification of monetary policy frameworks by Cobham (2020) which has a different approach and different sources. Section 5 provides an unconditional analysis of the inflation and growth associated with each stabilisation. Section 6 offers a conditional analysis. Section 7 concludes.

2 Methodology

The aim is to identify what, if any, variables the monetary authorities in different countries at different periods have actually stabilised in absolute terms, and then in relative terms what variable they have stabilised to the highest degree. The candidate variables are price level, money, real and nominal income, and exchange rates.² Exchange rates need to be considered against a variety of possible anchors including the US dollar (USD), French franc (FRF), Deutsche Mark (DM), European Currency Unit (ECU), Euro and Special Drawing Right (SDR).³

It would be possible (and natural) to look at the growth rates of the domestic variables and at the volatility of the exchange rates. But given the intention to compare the degree of stabilisation of the different variables, that degree needs to be measured in a common form, which covers the stabilisation of both levels and growth rates. This is done here by taking the standard deviation of the four quarter percentage growth rates of the variables concerned (price, money, exchange rate, etc), over the four quarters of each year together with the preceding and succeeding quarters (e.g. for 1974 from 1973 Q4 to 1975 Q1).⁴ This means that there is an overlap in the measure for each calendar year but it avoids the problem of, say, a 1st January change in exchange rate passing unnoticed; taking the standard deviation over six rather than four quarters also reduces the impact of outliers. In addition the measure allows a focus on the stability of the growth rate of the variables, without regard to the trend itself, so that both a fixed exchange rate (level) and a regular exchange rate crawl will be recognised as stabilised growth rates of the exchange rate, while stable inflation rates of 2% or 10% are considered on an equal footing.

We then apply some absolute criteria for deciding whether a variable has been stabilised or not, which are based on historical observation and experience. For inflation and real and nominal income growth, stability is defined to require a standard deviation of less than 0.5%, which means that in 68% of the cases (under a normal distribution) the variable must be no more than 0.5% away from its mean, and in 95% of cases no more than 1% from the mean: the latter corresponds, for example, to the most common width of the tolerance range for inflation targets (see Hammond, 2012). For exchange rates a threshold for the standard deviation of 1% is used; that corresponds roughly to the $\pm 2.25\%$ exchange rate bands agreed at the Smithsonian Institute in December 1971 and used for the narrow margins of the European Monetary System from

1979 to 1993. Broad money is clearly naturally more variable than other domestic variables, so the threshold here is also 1% instead of 0.5%. These criteria can be tabulated as follows:

variable	threshold criterion for absolute stability
price level P	s.d. of four-quarter growth rate < 0.5
broad money M	s.d. of four-quarter growth rate < 1.0
real GDP Y	s.d. of four-quarter growth rate < 0.5
nominal GDP PY	s.d. of four-quarter growth rate < 0.5
exchange rate vs USD, DM, etc	s.d. of four-quarter growth rate < 1.0

In the next section these criteria are applied, first for the exchange rates and then for the domestic variables. The results on how many variables can be regarded as stabilised are presented, then the analysis moves to identify what external and what domestic variable have been stabilised to the highest degree, that is with the lowest standard deviation of the growth rates. Finally, which exchange rate or domestic variable overall has been most stabilised is identified. These relative comparisons take account of the difference in the absolute threshold criteria, that is, the standard deviation for inflation is compared with 0.5*standard deviation for money or exchange rates.

Where no absolute criteria are fulfilled, that is, there is no stabilisation, it is convenient to make a broad distinction between cases where inflation is in some sense under control and those where it is not. This is done by using the arbitrary cut-off point of inflation < 5%.⁵ Where this criterion is fulfilled, even though no other absolute criterion is met, the outcome is considered as no (domestic/overall) stabilisation but 'constrained', whereas cases where inflation $\geq 5\%$ are considered as no (domestic/overall) stabilisation 'unconstrained'. The criteria and acronyms are summarised in Table A1 in the Appendix.

3 Application

In applying the methodology above to countries' exchange rates three further elements need to be taken into account: first, Ireland's currency was pegged 1:1 to the pound sterling from 1974 to 1978 (after which it joined the European Monetary System and diverged); second, the currencies of Lesotho, Swaziland and Namibia were and are pegged 1:1 to the South African rand within the Common Monetary Area throughout; and third, Bhutan's currency was and is pegged 1:1 to the Indian rupee throughout. In each case the standard deviation of the growth rate against the anchor currency is precisely zero.

Table 1 presents the results of applying the absolute threshold criteria to the various exchange rates considered, in terms of four subperiods: 1974-84, pre-Great Moderation; 1985-98 Great Moderation pre-European Monetary Union (EMU); 1999-2007 Great Moderation + EMU; and 2008-17 Global Financial Crisis (GFC) and its aftermath. While for most country-years either one or no exchange rates are stabilised on these criteria, there are smaller numbers for which two or more exchange rates are stabilised. Most of these cases reflect an unchanging parity between two or more anchors, for example, France and Germany had stable rates against each other in some years in the run-up to EMU, so that a number of smaller EU countries had stable rates in those years vis-à-vis the French franc and the ECU as well as the Deutsche Mark, while the former French colonies in the franc zone had stable rates against the DM and the ECU as well as against the franc.⁶

Table 2 shows what happens when we take the most narrowly stabilised exchange rate in each case. The advanced countries had an increasing incidence of stable exchange rates (mainly against the DM) in the second subperiod, followed by a marked reduction in the later

subperiods (post-1999 the member countries of the Eurozone become Xs in this approach, that is countries with no specific national monetary policy framework, while the Euro area in this period has no stabilised exchange rate). The emerging and the developing economies have less stable exchange rates in the second subperiod, more in the third and then (more clearly for the emerging) less in the fourth. DM and FRF pegs are replaced in most cases by Euro pegs, while the incidence of USD pegs declines gently for the emerging but less clearly for the developing countries. The incidence of no exchange rate stabilisation (NER) is high in all groups throughout, but less high among the developing countries.

Tables 3 and 4 provide comparable data for the domestic variables. Here there are rather fewer instances of two or more domestic variables being stabilised according to the absolute criteria, most of them advanced country cases where both money and prices have been stabilised, and some in the third subperiod reflecting Euro area stabilisation of real and nominal income growth as well. On the other hand there is a decline over time, particularly between the second and third subperiods, in the number of country-years where no domestic variable is stabilised. Table 4, which identifies the most stabilised domestic variables, shows a low incidence of money stabilisation except in the advanced countries, and even lower incidence of real or nominal income stabilisation.⁷ More importantly it shows a strong decline for each country group (except emerging between the third and fourth subperiods) in the incidence of no domestic stabilisation (unconstrained), and a strong rise in the incidence of no domestic stabilisation (constrained, i.e. with inflation < 5%), referred to respectively as NDS and NDSC.

Tables 5.1-3 show the final result from combining the 'best' exchange rate stabilisation and the 'best' domestic variable stabilisation to find the overall best stabilisation, for each country year. For the advanced countries some of the exchange rate stabilisations are now replaced by

domestic ones while some of the domestic stabilisations are replaced by exchange rate ones, but the major overall change is that the number of no overall stabilisations (NOS plus NOSC) is smaller, in most cases much smaller, than the numbers of either NER or NDS plus NDSC shown in Tables 2 and 4. That pattern can also be found in the emerging economies and the developing countries. It indicates that some of the countries which stabilised their exchange rates were also stabilising a domestic variable, so one of these is knocked out by the other, but when external and domestic variables are put together the proportion stabilising neither is lower, because many countries not stabilising their exchange rate were stabilising a domestic variable, and vice-versa.

What are the overall trends revealed by this exercise? Over the first three subperiods, the advanced countries show a strong rise in the proportion of domestic stabilisations, above all price stabilisations, a fall in exchange rate stabilisations (after the second subperiod) and a strong switch from no overall stabilisation unconstrained to no overall stabilisation constrained. In the fourth subperiod the extent of price stabilisation, which rose from 7.7% in the first to 36.5% in the third, falls back. Real and nominal income stabilisations are never very important, while money stabilisations fluctuate, with a sharp rise in the fourth subperiod.

For the emerging economies domestic stabilisations become gradually more important while exchange rate stabilisations fluctuate. Real and nominal income stabilisations are infrequent but real income stabilisations are more important in the third and fourth subperiods, while money stabilisations are more frequent than real income ones. No overall stabilisations unconstrained fall sharply from the second to the third subperiod but rise a little in the fourth, while no overall stabilisations constrained rise to a peak in the third but fall back in the fourth

subperiod. Price stabilisations rise in each subperiod but remain well below the frequency in advanced economies.

For the developing countries exchange rate stabilisations are high throughout (with minor fluctuations in USD stabilisations and a big switch from FRF to Euro stabilisations), but lower in the second subperiod (reflecting in large part the devaluation of the CFA franc in January 1994), while domestic stabilisations (mainly price) rise but remain relatively infrequent.

The annual developments are tracked in Figures 1-3, which also make clear the high degree of year to year variation.⁸

4 Stabilisations and monetary policy frameworks

We now compare our (most) stabilised variables with the classification of monetary policy frameworks (hereinafter referred to as MPFs), due to Cobham (2020).⁹ These MPFs are defined as "combinations of the objectives of the monetary authorities (including their understanding of the trade-offs between those objectives) and the set of constraints and conventions – the former more binding, the latter more matters of established usage – within which specific (conjunctural) monetary policy decisions are made. The constraints and conventions which are relevant here include the rules or disciplines to which the authorities are subject (voluntarily or involuntarily), the nature of the financial and monetary markets and institutions in existence, the understandings (on the parts of the monetary authorities and of the society) of key macroeconomic relationships, and the political environment within which the monetary authorities operate." The information used to determine these classifications comes from the papers of the regular Article IV consultations of the IMF with its members. The MPFs are obviously quite different in conception from the stabilisation variables identified in this paper,

but the extent to which broadly similar categories – for example, price stabilisation and inflation targeting – overlap is of some interest.

Cobham identifies 32 different MPFs, but here we will focus on the target variable aggregation of these MPFs. An exchange rate fix (ERfix) is one where the monetary authority dominates forex transactions and sets (typically very narrow) margins for transactions, while exchange rate targeting (ERTs) is where there is an autonomous forex market and interest rates as well as market intervention are used to influence the exchange rate. Inflation targeting is denoted as ITs and monetary targeting as MTs, and any combination of inflation, exchange rate and monetary targeting is denoted as MixedTs. A monetary framework with no pre-announced objectives or targets is defined as having a ‘discretionary’ framework. These MPFs are divided between 'unstructured' (UD), 'loosely structured' (LSD) and 'well structured' (WSD), on the basis of the instruments available to the monetary authorities as well as their (unquantified, even unarticulated) objectives. Finally, the category of 'multiple direct controls' (MDC) is used to cover command economies with no real monetary policy.

The comparison is shown in Table 6, where we present frequency and (two-way) relative frequency data on our two sets of variables, the stabilisation variables developed in this paper and the target variable MPFs constructed in Cobham (2020). The Table covers advanced and emerging economies but excludes observations for developing economies as the MPF variables are not yet available for most of these countries. We aggregate all the various exchange rate stabilisations identified, i.e. USD, SDR, DM, FRF, GBP, ECU, and Euro, in the single category ER. Each cell in the Table consists of three numbers. The top number is the frequency, for example in the top left cell we have 9 observations in our sample where our MPF is MDC and our stabilisation variable is ER. The middle number 1.91% is that 9 as a percentage of the total

of ER cases, while the bottom number 16.67% is the 9 as a percentage of the total of MDC cases. We have excluded from the Table all cases where either there is no MPF variable (no national monetary framework existed) or the stabilisation variable is X. These include cases where countries are members of a currency union or use another's currency, and countries which did not then exist as separate countries or for which the statistical data are not available.

The overall point to be made from the table is that the overlap between broadly corresponding categories of the two sets is far from complete, but nevertheless considerable. 71% of the cases of ER stabilisation are also cases of ERFix or ERTs, but 13% are LSD. On the other hand, 52% of ERFix cases and 56% of ERTs cases are ER, while large percentages also fall into the NOS and NOSC categories. 52% of P stabilisations are ITs, with the rest mainly ERTs and LSD, while 27% of ITs cases are P stabilisations, 13% M, 35% NOSC, and 12% NOS. 11% of the M stabilisations are MTs, but 36% are ITs, 25% LSD and 15% ERTs, while 28% of the MTs are M, 29% are NOS and the rest are mainly NOSC and P. Where there is no specific stabilisation or target, 41% of NOS cases are LSD, 26% UD and 12% ERTs, while 54% of NOSC cases are ITs, with the rest mainly ERTs and LSD. On the other hand, 91% of UD and 58% of LSD cases are NOS, while the rest of the LSD cases are mostly ER, NOSC, P, and M, in that order. 74% of MDC cases are NOS, with the rest mainly ER and NOSC. Finally the MixedTs cases are spread mainly over ER, P, M, NOS and NOSC, in that order. Thus, while there are important overlaps, they are far from complete. This relative lack of correspondence reflects the tightness of the criteria for the stabilisation variables versus the broader perspective taken in the MPF classification, but the extent of the overlap suggests that both approaches are identifying some genuine features of the way monetary policy is being operated.

5 Stabilisations and economic performance: unconditional analysis

Tables 7.1-3 show the inflation and per capita GDP growth rates associated on average with each of the stabilisations, for each group of countries (but note that for some stabilisations the incidence is very low so little significance should be attached to the results). For the advanced countries the main trends in Table 7.1 are the improvement in inflation over time and the fall in growth in the GFC subperiod, as shown in the final row of the table (trends which seem to outweigh the differences between the various stabilisations); the much poorer performance throughout under NOS (no overall stabilisation unconstrained); and the fact that price stabilisation is sometimes, but not always, associated with lower inflation and/or higher growth than NOSC. For the emerging economies in Table 7.2 the same trends can be seen, but the fall in inflation (starting here from the second subperiod) goes less far, and in the fourth subperiod inflation rises while growth falls though less than for the advanced economies. For the developing countries in Table 7.3 there is a sharp fall in overall inflation in the fourth as well as the third subperiod, but in other respects the results are broadly similar; inflation performance is better under FRF or Euro than USD stabilisation, but growth performance worse. In addition, for both emerging and developing groups, NOSC (no overall stabilisation constrained) is associated with better performance than NOS (no overall stabilisation unconstrained) and sometimes, particularly on inflation, than price stabilisation.

6 Conditional analysis of inflation and growth

now turn to analyse the economic performance associated with different stabilisations via a conditional analysis which allows for the effects of other variables on inflation and growth. The analysis that follows is broadly comparable to those undertaken for different exchange rate regimes by Ghosh et al. (2002) and Husain, Mody and Rogoff (2005).

Tables 8.1 to 8.3 present results from a fixed effect regression of inflation on stabilisation variables, three standard control variables (GDP growth, openness and the growth of broad money) and year dummies. The conditional analysis is conducted for the whole period as well as over the subperiods identified above. Note, we use NOS as our ‘benchmark’ stabilisation variable over the period as a whole as well as for the first two subperiods. However, since the number of ‘no overall stabilisations’ becomes very small in advanced economies during the final two subperiods, we use NOSC then instead. Of the control variables, growth is typically significantly negative and monetary growth significantly positive, as we would expect, while openness is only sometimes significant (and positive).

The results of Regression (1) in Table 8.1 (advanced economies, full period) suggest most of the stabilisation variables are associated with lower inflation, relative to NOS. All coefficients are negatively signed and significant, with the exception of Euro and GBP. For the pre-great Moderation period, Regression (2), NOSC, P, DM, USD and FRF are negative and significant, and for the Great Moderation pre-EMU period, Regression (3), all relevant stabilisation variables are negative and significant. Regressions (4) and (5), the Great Moderation + EMU and the GFC and aftermath respectively, where the benchmark is NOSC, show NOS as significantly positive. Most other stabilisation variables are insignificant, although Euro is negatively significant in Regression (4). One feature of Regressions (1) to (3) is that NOSC is associated with slightly lower inflation than both P and M,¹⁰ in that the absolute value of the coefficient on NOSC is consistently greater than that on the other two variables. These differences are significant in Regression (1), where the relevant p-values are 0.028 and 0.068 respectively, but not for Regressions (2) or (3). This relationship does not hold for Regressions (4) and (5), where P is associated with very slightly lower inflation and M with almost identical inflation (both the differences are insignificant).

The regressions in Table 8.2 provide results over the same period and subperiods for the emerging economies. In this case, there is much weaker evidence that the stabilisation variables are associated with lower inflation. In Regression (1), NOSC, M, P, Euro, FRF and SDR are negative and significant, while the other stabilisation variables are all insignificant but negatively signed. Of the stabilisation variables across Regressions (2) and (3), only FRF is significant and negative in (3), while a number of coefficients are positive. Note, however that the NOSC coefficient is negatively signed (but insignificant) in Regressions (2) and (3). The null hypothesis of a test of coefficient equality is only rejected for NOSC and P in regression (2) (at a 10% level of significance). For Regressions (4) and (5), NOS is positive and significant. Coefficients on the stabilisation variables are all positive, with the exception of USD and SDR in Regression (4) and of SDR and Euro in Regression (5), and the coefficients on all the stabilisation variables other than NOS are insignificant with the exception of Y in Regression (4).

Table 8.3 presents the results for the developing economies. Over Regressions (1) to (3) the coefficients on all stabilisation variables are negatively signed with the exception of P and FRF in Regression (3), and just under half are significant (exceptions are in Regression (1): M, ECU, Euro, FRF and SDR; in Regression (2): P, FRF and SDR; and Regression (3): M, P, FRF and SDR). The coefficient on NOSC is significant across all three regressions, and as was the case for the advanced economy regressions, is consistently greater in magnitude than the coefficients on both P and M. It is also significantly different from P in Regressions (1) and (3) at the 10% significance level as well as being significantly different from M in Regression (1) (at the 5% significance level), Regression (2) (at the 1% significance level) and Regression (3) (at the 10% significance level). NOSC is also greater in magnitude relative to all other

stabilisation variable coefficients except those on ECU and DM in Regression (3).¹¹ The coefficient on NOS is significant and positive in Regressions (4) and (5) and all other stabilisation variables are positively signed, except Euro in Regression (4) and M and Euro in Regression (5). All coefficients are insignificant with the exception of M in Regression (4) and P in Regression (5).

Tables 8.4 to 8.6 also present results from a fixed effect regression of real per-capita GDP growth on stabilisation variables, standard control variables (openness, gross fixed capital, population, population growth and years of schooling) and year dummies. Table 8.4 presents results for advanced economies. As with the inflation regressions we use NOS as our benchmark stabilisation variable for Regressions (1) to (3) and NOSC for Regressions (4) and (5). Of the control variables, growth is often and gross fixed capital formation mostly significantly positive, while the population variables and schooling are sometimes significant.

Over Regressions (1) to (3) on Table 8.4, all the stabilisation variables are positively signed with the exception of USD in Regression (1) and DM in Regression (2). Coefficients on P, ECU, FRF and SDR are significant in Regression (1), in Regression (2) coefficients on NOSC, DM, USD, SDR and GBP are significant and in Regression (3) all coefficients are significant apart from NOSC, PY and USD. Note that the coefficient on NOSC is smaller than that on P, but larger than that on M for Regression (1), although these differences are statistically insignificant. In Regression (2) the coefficient on NOSC is larger than that on both P and M, although is only statistically different from M (at a 10% level of significance), and in Regression (3) NOSC is smaller than both P and M, although only statistically different from P (at a 5% level of significance). For regression (4) all stabilisation variables have insignificant coefficients with the exception of USD. All the stabilisation variables have negatively signed

coefficients, with the exception of NOS and PY. For Regression (5) results are somewhat different: the coefficient on NOS is negative and significant. All other stabilisation coefficients are positive (with the exception of P) but not significant.

For Table 8.5 (emerging economies), the coefficients on the stabilisation variables in Regression (1) are positive with the exception of M, Y, Euro and FRF, and only ECU, Euro (which is negatively signed) and SDR are significant. For Regression (2) only NOSC, ECU and USD have positively signed coefficients, and only FRF (which is negatively signed) and ECU are significant. For Regression (3), all stabilisation variables have positively signed coefficients, with the exception of ECU and FRF, and NOSC and P are significant. Note that the coefficient on NOSC is greater than that for both M and P for Regressions (1) and (2), although only the difference between P and NOSC in Regression (2) is significant (at the 10% level). In Regression (3) NOSC is greater than M but less than P, although these differences are insignificant. In Regressions (4) and (5), all of the coefficients are negatively signed, with the exception of P in Regression (5), although none of these stabilisation coefficients are significant, with the exception of Euro in Regression (4).

For Table 8.6 (developing economies) the stabilisation variables coefficients in Regression (1) are significantly positive for NOSC, USD and SDR; positive but insignificant for P, Y and FRF; negative and significant for ECU and negative but insignificant for M and Euro. All coefficients in Regression (2) are insignificant, as are the coefficients in Regression (3), with the exception of M (positively signed) and ECU (negatively signed). The coefficient on NOSC is greater than that on both P and M in Regressions (1) and (2), although in Regression (3) the coefficient on NOSC is greater than that on P but less than that on M. However, none of these differences are statistically significant.¹²

7 Conclusions

In this paper we have used a simple and transparent statistical method, together with a set of straightforward threshold criteria, to identify what variables have been (successfully) stabilised and which have been stabilised most narrowly by the monetary authorities in a wide range of countries, between 1974 and 2017. The main trends revealed are the increasing emphasis on domestic variable as opposed to external (exchange rate) stabilisations; within the domestic stabilisations the primacy of price over money over real or nominal income stabilisations; within the external stabilisations the predictable shifts between European currency anchors and the euro, and the continuing roles for USD and Euro stabilisations; and the switch over time from unconstrained to constrained no overall stabilisation, where the constraint is whether average inflation is less than 5%. These trends vary in strength and to some extent timing, as between the three groups of economies, and are in some cases temporarily interrupted by the Global Financial Crisis. The stabilisations identified overlap to some extent but not completely with the related monetary policy frameworks identified in Cobham (2020). This reflects the differences between the two identifications in terms of conception and sources, but also suggests that the two sets of variables are both picking up some genuine features of how monetary policy is operated.

We then asked how the various types of stabilisation are associated with different economic performance in terms of inflation and growth, first through a simple unconditional analysis and then through a conditional analysis of a standard kind. The two approaches turn out to produce broadly similar results. The clearest findings are that no overall stabilisation constrained is typically associated with much better performance than no overall stabilisation unconstrained and typically with as good performance as price stabilisation; it is difficult to distinguish

between the other domestic variable stabilisations; exchange rate stabilisations tend to be associated with lower inflation but not always with better growth; and in general the different stabilisations seem to have less clear and consistent effects on growth than on inflation.

Macroeconomic outcomes depend on the shocks experienced as well as the competence (technical expertise) and commitment (determination) of the monetary authorities, so it is not possible to read back from the results to the preferences or even the behaviour of the monetary authorities. Nevertheless, the results can be taken to support the proposition that what matters for the macro outcomes is whether the monetary authorities are able and determined to keep inflation under control, rather than which of several different domestic and external variables they actually succeed in stabilising.

Notes

¹ The identification of advanced and emerging economies is that of Laurens et al. (2009), except that we include Hong Kong and Luxembourg in the advanced category, and Malta and Cyprus as emerging. Small countries, that is countries with population of less than 250,000, are excluded.

² Money here is taken as broad money, for which data are most easily available.

³ Data on effective exchange rates, nominal or real, are not available for many of the countries in the sample over the period considered, but exchange rates against the SDR offer a simple weighted average.

⁴ Where a currency does not exist in the first quarter of the next or the last quarter of the preceding year (e.g. with the switch from ECU to Euro in 1999), the standard deviation is taken over five rather than six quarters.

⁵ A broadly comparable arbitrary cut-off was used by Reinhart and Rogoff (2004) – inflation $\geq 40\%$ – to distinguish freely falling from freely floating exchange rates.

⁶ Similarly, when South Africa's currency was stable against the USD in the late 1970s, so were those of Lesotho, Namibia and Swaziland.

⁷ It should be noted that many developing countries in particular have no quarterly data for real or nominal income, which means – not just on the criteria used here but in reality as well – that they cannot stabilise these variables.

⁸ This high degree of variation over time in the stabilisation variables suggests there is unlikely to be a significant endogeneity issue in our inflation regressions (see Tables 8.1 to 8.3): given the relatively short duration of our stabilisation variables it is unlikely causality runs from (current) inflation to (current) stabilisation. This is particularly true if we think of our stabilisation variables as being influenced by the policy choices of a monetary authority given the lags associated with planning, implementation and transmission. In addition, while a

country or central bank that has got inflation down might gain from identifying itself as an inflation targeter and therefore choose to do so, it is not clear that it would gain anything from doing what is required to identify itself for a particular year as having chosen to stabilise price in the way required for our price stabilisation variable.

⁹ See also www.monetaryframeworks.org and Cobham, Macmillan, Mason and Song (2020).

¹⁰ We focus our discussion in the main around NOS, NOSC, P, and M. They account for around 80% of the stabilisation variables in the full period inflation regressions. In Regression (2) NOS and M occur with high frequency, accounting for around 60%, and in Regression (3) NOS, NOSC, M and P account for around 80% of the stabilisation variables. Note that the frequency of the stabilisation variables in the estimated regressions can differ to those presented in Tables 5.1 to 5.3 due to missing data and also because of occasional collinearity in stabilisation variables in subperiod regressions as a result of using fixed effect estimation in the panel data set.

¹¹ Note that ECU and DM are very low frequency stabilisation variables in this regression.

¹² We should note that for the developing country growth regressions domestic stabilisation variables, except for NOSC and NOS, occur with relatively low frequency.

Data availability statement

The data on the stabilisations identified in the paper are available from the authors on request.

The data on the monetary policy frameworks used are available at www.monetaryframeworks.org. The data on schooling were obtained from the Barro and Lee Dataset at <http://www.barrolee.com/data/full1.htm>. All the other data that support the findings of the study are available from the International Monetary Fund at <https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b> or from the World Bank at <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>.

References

- Ball, L. (2010), 'The performance of alternative monetary regimes', in B. Friedman and M. Woodford (eds), *Handbook of Monetary Economics*, volume 3B, North Holland
- Ball, L., and Sheridan, N. (2005), 'Does inflation targeting matter?', in B. Bernanke and M. Woodford (eds), *The Inflation-Targeting Debate*, Chicago: University of Chicago Press
- Barro, R., and Lee, J-W., Barro-Lee Educational Attainment Dataset, at <http://www.barrolee.com/data/full1.htm>
- Cobham, D. (2020), 'A comprehensive classification of monetary policy frameworks for advanced and emerging economies', forthcoming in *Oxford Economic Papers*, <https://doi.org/10.1093/oep/gpz057>
- Cobham, D., Classification of monetary policy frameworks, at www.monetaryframeworks.org
- Cobham, D., Macmillan, P., Mason, C. and Song, M. (2020), 'Economic performance under different monetary policy frameworks', under preparation
- Cobham, D., and Song, M. (forthcoming), 'Transitions between monetary policy frameworks and their effects on economic performance', *Economic Modelling*, <https://doi.org/10.1016/j.econmod.2020.02.049>:
- Ghosh, A., Gulde, A-M., and Wolf, H. (2002), *Exchange Rate Regimes: Choices and Consequences*, Cambridge, Mass.: MIT Press
- Hammond, G. (2012), 'State of the art of inflation targeting', Handbook no. 29, Centre for Central Banking Studies, Bank of England
- Husain, A., Mody, A., and Rogoff, K. (2005), 'Exchange rate regime durability and performance in developing versus advanced economies', *Journal of Monetary Economics*, 52, 35-64
- Ilzetzki, E., Reinhart, C., and Rogoff, K. (2019), 'Exchange rate arrangements entering the 21st century: which anchor will hold?', *Quarterly Journal of Economics*, 134: 599-646

International Monetary Fund, *International Financial Statistics*, at

<https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b>.

Laurens, B., Arnone, M., and Segalotto, J. (2009), *Central Bank Independence,*

Accountability, and Transparency: A Global Perspective, Basingstoke: Palgrave

Macmillan

Levy-Yeyati E. and Sturzenegger, F. (2005), 'Classifying Exchange rate Regimes: Deeds vs.

Words', *European Economic Review*, 49(6): 1603-35

Levy-Yeyati E. and Sturzenegger, F. (2016), 'Classifying exchange rate regimes: 15 years

later', Harvard Kennedy School working paper RWP16-028, Harvard University,

Cambridge, MA, USA

Mishkin, F., and Schmidt-Hebbel, K. (2007), 'Does inflation targeting make a difference?', in

F. Mishkin and K. Schmidt-Hebbel (eds), *Monetary Policy under Inflation Targeting*,

Central Bank of Chile

Reinhart, C., and Rogoff, K. (2004) 'The modern history of exchange rate arrangements: a

reinterpretation', *Quarterly Journal of Economics*, 119(1): 1-48

Schmidt-Hebbel, K. (2010), 'Inflation targeting twenty years on: where, when, why, with what

effects and what lies ahead?' in D. Cobham, Ø. Eitrheim, S. Gerlach and J. Qvigstad

(eds), *Twenty Years of Inflation Targeting*, Cambridge: Cambridge University Press

Tavlas, G., Dellas, H., and Stockman, A. (2008), 'The classification and performance of

alternative exchange-rate systems', *European Economic Review*, 52(6): 941-63

Walsh, C. (2009), 'Inflation targeting: what have we learned?', *International Finance*, 12:2:

195–233

World Bank, World Development Indicators, at

<https://databank.worldbank.org/reports.aspx?source=world-development-indicators>.

Table 1: Exchange rates stabilised, country-years

	1974-84	1985-98	1999-2007	2008-17
Advanced				
2 or more ERs stabilised	12	65	1	0
1 ER stabilised	34	65	23	21
0 ERs stabilised	240	234	113	129
X	11	14	106	120
Emerging				
2 or more Ers stabilised	9	8	3	1
1 ER stabilised	67	66	91	54
0 ERs stabilised	188	304	202	222
X	99	81	1	53
Developing				
2 or more Ers stabilised	55	129	7	5
1 ER stabilised	528	439	489	536
0 ERs stabilised	462	823	482	555
X	165	149	12	4

Note: X indicates that the country either did not exist (e.g. Czech Republic before 1993) or it had no specific national monetary policy (e.g. members of European Monetary Union from 1999).

Table 2: Exchange rates most stabilised, country-years and percent

	1974-84		1985-98		1999-2007		2008-17	
Advanced	no.	%	no.	%	no.	%	no.	%
SDR	5	1.75	5	1.37	1	0.73	0	0.00
USD	4	1.40	17	4.67	13	9.49	10	6.67
DM	19	6.64	62	17.03	0	0.00	0	0.00
FRF	5	1.75	21	5.77	0	0.00	0	0.00
GBP	5	1.75	0	0.00	0	0.00	0	0.00
ECU	13	4.55	25	6.87	0	0.00	0	0.00
Euro	0	0.00	0	0.00	10	7.30	11	7.33
NER	235	82.17	234	64.29	113	82.48	129	86.00
X	11		14		106		120	
Total	297	100	378	100	243	100	270	100
All ERs	51	17.83	130	35.71	24	17.52	21	14.00
Emerging	no.	%	no.	%	no.	%	no.	%
SDR	16	6.06	14	3.68	13	4.39	3	1.08
USD	50	18.94	44	11.58	32	10.81	15	5.42
DM	1	0.38	5	1.32	0	0.00	0	0.00
FRF	1	0.38	3	0.79	0	0.00	0	0.00
ECU	8	3.03	8	2.11	0	0.00	0	0.00
Euro	0	0.00	0	0.00	49	16.55	37	13.36
NER	188	71.21	306	80.53	202	68.24	222	80.14
X	99		82		1		53	
Total	363	100.00	462	100.00	297	100.00	330	100.00
All ERs	76	28.79	74	19.47	94	31.76	55	19.86
Developing	no.	%	no.	%	no.	%	no.	%
SDR	60	5.74	41	2.95	20	2.04	19	1.73
USD	297	28.42	300	21.57	270	27.61	286	26.09
DM	0	0.00	1	0.07	0	0.00	0	0.00
FRF	180	17.22	168	12.08	0	0.00	0	0.00
ECU	2	0.19	2	0.14	0	0.00	0	0.00
Euro	0	0.00	0	0.00	170	17.38	196	17.88
RAND	33	3.16	42	3.02	27	2.76	30	2.74
RUP	11	1.05	14	1.01	9	0.92	10	0.91
NER	462	44.21	823	59.17	482	49.28	555	50.64
X	165		149		12		4	
Total	1210	100.00	1540	100.00	990	100.00	1100	100.00
All ERs	583	55.79	568	40.83	496	50.72	541	49.36

Note: the percentages are percentages of the total minus the Xs.

Table 3: Domestic variables stabilised, country-years

	1974-84	1985-98	1999-2007	2008-17
Advanced				
2 or more DVs stabilised	15	58	35	47
1 DV stabilised	71	130	58	51
0 DVs stabilised	200	176	44	52
X	11	14	106	120
Emerging				
2 or more DVs stabilised	1	2	10	25
1 DV stabilised	13	41	64	67
0 DVs stabilised	250	338	222	185
X	99	81	1	53
Developing				
2 or more DVs stabilised	0	4	4	14
1 DV stabilised	18	60	73	166
0 DVs stabilised	1027	1327	901	916
X	165	149	12	4

Table 4: Domestic variables most stabilised, country-years and percent

	1974-84		1985-98		1999-2007		2008-17	
Advanced	no.	%	no.	%	no.	%	no.	%
P	26	9.09	129	35.44	60	43.80	48	32.00
PY	0	0.00	5	1.37	11	8.03	5	3.33
Y	7	2.45	10	2.75	4	2.92	15	10.00
M	53	18.53	44	12.09	18	13.14	30	20.00
NDS	176	61.54	81	22.25	4	2.92	6	4.00
NDSC	24	8.39	95	26.10	40	29.20	46	30.67
X	11		14		106		120	
Total	26	9.09	129	35.44	60	43.80	48	32.00
All dom	86	30.07	188	51.65	93	67.88	98	65.33
Emerging	no.	%	no.	%	no.	%	no.	%
P	7	2.65	18	4.72	40	13.51	34	12.27
PY	0	0.00	0	0.00	2	0.68	6	2.17
Y	0	0.00	4	1.05	16	5.41	24	8.66
M	7	2.65	21	5.51	16	5.41	28	10.11
NDS	223	84.47	280	73.49	95	32.09	90	32.49
NDSC	27	10.23	58	15.22	127	42.91	95	34.30
X	99		81		1		53	
Total	363	100	462	100	297	100	330	100
All dom	14	5.30	43	11.29	74	25.00	92	33.21
Developing	no.	%	no.	%	no.	%	no.	%
P	9	0.86	44	3.16	60	6.13	118	10.77
PY	0	0.00	0	0.00	0	0.00	5	0.46
Y	0	0.00	1	0.07	1	0.10	10	0.91
M	9	0.86	19	1.37	16	1.64	47	4.29
NDS	949	90.81	1013	72.83	532	54.40	476	43.43
NDSC	78	7.46	314	22.57	369	37.73	440	40.15
X	165		149		12		4	
Total	1210	100	1540	100	990	100	1100	100
All dom	18	1.72	64	4.60	77	7.87	180	16.42

Note: the percentages are percentages of the total minus the Xs.

Table 5.1: Variables most stabilised, country-years and per cent, advanced economies

	1974-84		1985-98		1999-2007		2008-17	
Advanced	no.	%	no.	%	no.	%	no.	%
USD	4	1.40	17	4.67	12	8.76	10	6.67
SDR	5	1.75	4	1.10	0	0.00	0	0.00
DM	18	6.29	53	14.56	0	0.00	0	0.00
FRF	5	1.75	15	4.12	0	0.00	0	0.00
GBP	5	1.75	0	0.00	0	0.00	0	0.00
ECU	9	3.15	19	5.22	0	0.00	0	0.00
Euro	0	0.00	0	0.00	10	7.30	10	6.67
M	47	16.43	33	9.07	16	11.68	30	20.00
Y	7	2.45	8	2.20	3	2.19	11	7.33
PY	0	0.00	4	1.10	11	8.03	4	2.67
P	22	7.69	89	24.45	50	36.50	42	28.00
NOS	150	52.45	63	17.31	4	2.92	5	3.33
NOSC	14	4.90	59	16.21	31	22.63	38	25.33
X	11		14		106		120	
Total	297	100	378	100	243	100	270	100
All ERs	46	16.08	108	29.67	22	16.06	20	13.33
All dom	76	26.57	134	36.81	80	58.39	87	58.00

Note: the percentages are percentages of the total minus the Xs.

Table 5.2: Variables most stabilised, country-years and per cent, emerging economies

	1974-84		1985-98		1999-2007		2008-17	
Emerging	no.	%	no.	%	no.	%	no.	%
USD	49	18.56	43	11.29	32	10.81	15	5.42
SDR	15	5.68	13	3.41	13	4.39	1	0.36
DM	1	0.38	5	1.31	0	0.00	0	0.00
FRF	1	0.38	3	0.79	0	0.00	0	0.00
ECU	8	3.03	8	2.10	0	0.00	0	0.00
Euro	0	0.00	0	0.00	46	15.54	36	13.00
M	6	2.27	15	3.94	13	4.39	23	8.30
Y	0	0.00	3	0.79	10	3.38	20	7.22
PY	0	0.00	0	0.00	1	0.34	5	1.81
P	1	0.38	13	3.41	23	7.77	30	10.83
NOS	167	63.26	245	64.30	73	24.66	83	29.96
NOSC	16	6.06	33	8.66	85	28.72	64	23.10
X	99		81		1		53	
Total	363	100	462	100	297	100	330	100
All ERs	74	28.03	72	18.90	91	30.74	52	18.77
All dom	7	2.65	31	8.14	47	15.88	78	28.16

Note: the percentages are percentages of the total minus the Xs.

Table 5.3: Variables most stabilised, country-years and per cent, developing countries

	1974-84		1985-98		1999-2007		2008-17	
Developing	no.	%	no.	%	no.	%	no.	%
USD	296	28.33	300	21.57	269	27.51	283	25.82
SDR	60	5.74	40	2.88	20	2.04	18	1.64
DM	0	0.00	1	0.07	0	0.00	0	0.00
FRF	180	17.22	166	11.93	0	0.00	0	0.00
ECU	2	0.19	1	0.07	0	0.00	0	0.00
Euro	0	0.00	0	0.00	170	17.38	196	17.88
RUP	11	1.05	14	1.01	9	0.92	10	0.91
RAND	33	3.16	42	3.02	27	2.76	30	2.74
M	6	0.57	10	0.72	9	0.92	16	1.46
Y	0	0.00	1	0.07	0	0.00	8	0.73
PY	0	0.00	0	0.00	0	0.00	2	0.18
P	3	0.29	17	1.22	19	1.94	66	6.02
NOS	441	42.20	693	49.82	329	33.64	324	29.56
NOSC	13	1.24	106	7.62	126	12.88	143	13.05
X	165		149		12		4	
Total	1210	100.00	1540	100.00	990	100.00	1100	100.00
All ERs	582	55.69	564	40.55	495	50.61	537	49.00
All dom	9	0.86	28	2.01	28	2.86	92	8.39

Note: the percentages are percentages of the total minus the Xs.

Table 6: Stabilisations versus monetary policy frameworks

Stabilisation	Target variable MPF									
	MDC	ERfix	ERTs	MTs	ITs	MixedTs	UD	LSD	WSD	Total
ER	9 1.91 16.67	53 11.28 52.48	281 59.79 56.31	5 1.06 6.67	16 3.4 3.08	29 6.17 29.9	14 2.98 6.33	62 13.19 11.25	1 0.21 8.33	470 100 22.07
M	0 0 0	3 1.64 2.97	27 14.75 5.41	21 11.48 28	66 36.07 12.69	15 8.2 15.46	3 1.64 1.36	45 24.59 8.17	3 1.64 25	183 100 8.59
Y	0 0 0	0 0 0	5 8.06 1	5 8.06 6.67	33 53.23 6.35	4 6.45 4.12	0 0 0	13 20.97 2.36	2 3.23 16.67	62 100 2.91
PY	0 0 0	0 0 0	1 4 0.2	0 0 0	22 88 4.23	0 0 0	0 0 0	2 8 0.36	0 0 0	25 100 1.17
P	0 0 0	1 0.37 0.99	43 16.1 8.62	11 4.12 14.67	140 52.43 26.92	22 8.24 22.68	1 0.37 0.45	49 18.35 8.89	0 0 0	267 100 12.54
NOS	40 5.1 74.07	32 4.08 31.68	92 11.73 18.44	22 2.81 29.33	60 7.65 11.54	15 1.91 15.46	201 25.64 90.95	321 40.94 58.26	1 0.13 8.33	784 100 36.81
NOSC	5 1.47 9.264	12 3.54 11.88	50 14.75 10.02	11 3.24 14.67	183 53.98 35.19	12 3.54 12.37	2 0.59 0.9	59 17.4 10.71	5 1.47 41.67	339 100 15.92
Total	54 2.54 100	101 4.74 100	499 23.43 100	75 3.52 100	520 24.41 100	97 4.55 100	221 10.38 100	551 25.87 100	12 0.56 100	2,130 100 100

Note: in each cell the top number is the number of cases where the relevant stabilisation variable coincides with the relevant MPF, the middle number is those cases as a percentage of the total number of cases of the relevant stabilisation, and the bottom number is those cases as a percentage of the total number of cases of the relevant MPF.

Table 7.1: Economic performance, unconditional analysis, advanced economies

	1974-84		1985-98		1999-2007		2008-17	
	inflation	growth	inflation	growth	inflation	growth	inflation	growth
USD	8.81	9.46	6.67	3.79	-0.43	3.71	3.22	2.04
SDR	8.83	5.65	5.62	4.75				
DM	5.93	1.81	2.31	2.81				
FRF	9.17	1.96	3.34	2.63				
GBP	15.42	3.76						
ECU	8.16	2.61	4.38	3.75				
Euro					1.92	1.91	1.54	0.21
M	9.54	1.92	2.56	2.33	1.37	1.66	1.27	1.20
Y	9.61	2.65	3.02	2.70	1.99	2.37	1.79	1.16
PY			3.19	2.68	1.84	3.34	1.73	0.66
P	7.41	2.32	2.82	2.82	1.81	2.40	1.26	1.62
NOS	16.09	2.12	10.69	1.94	5.81	3.73	8.36	-2.69
NOSC	3.67	4.03	2.52	1.95	2.31	3.20	2.22	0.12
All	12.25	2.40	4.36	2.58	1.81	2.69	1.99	0.79

Table 7.2: Economic performance, unconditional analysis, emerging economies

	1974-84		1985-98		1999-2007		2008-17	
	inflation	growth	inflation	growth	inflation	growth	inflation	growth
USD	12.63	3.16	8.67	4.33	2.74	4.49	5.47	0.83
SDR	6.82	5.88	6.49	3.52	5.10	6.42		
DM	9.41	1.12	23.65	8.36				
FRF	9.72	-0.23	6.57	1.68				
ECU	5.03	0.24	7.44	-3.51				
Euro					4.32	5.59	2.55	1.09
M	17.31	1.46	5.98	3.46	4.14	3.32	3.26	2.01
Y			11.79	0.29	6.32	3.33	3.58	3.88
PY					5.49	3.40	3.99	2.98
P	11.02	-0.38	5.43	5.12	3.39	3.79	3.36	2.52
NOS	56.34	2.00	162.93	1.60	16.23	3.29	27.55	1.81
NOSC	2.75	6.70	2.84	4.15	2.68	3.82	2.53	2.52
All	37.75	2.85	106.27	2.51	6.64	4.11	7.00	2.00

Table 7.3: Economic performance, unconditional analysis, developing countries

	1974-84		1985-98		1999-2007		2008-17	
	inflation	growth	inflation	growth	inflation	growth	inflation	growth
USD	12.33	0.57	13.12	0.75	4.89	3.50	4.44	1.52
SDR	10.10	1.69	14.10	0.68	11.91	7.98	6.91	3.99
DM			2.47	0.87				
FRF	11.74	0.76	4.44	1.42				
ECU	5.03	0.24	7.44	-3.51				
Euro					2.36	2.55	2.66	1.17
RAND	11.22	5.52	9.21	5.96	1.73	5.99	6.75	5.02
RUP	14.19	1.78	12.33	2.09	6.81	2.73	6.35	2.27
M	11.76	-1.30	42.22	2.33	10.38	1.58	4.99	2.70
Y							3.81	3.45
PY								
P	4.51	-8.80	4.83	3.88	5.18	4.73	4.59	2.67
NOS	28.70	0.40	202.16	0.50	107.42	2.69	14.21	2.08
NOSC	1.88	0.86	1.92	1.16	1.93	3.65	2.49	1.96
All	18.32	0.57	108.84	0.79	40.70	3.16	6.77	1.85

Table 8.1: Inflation Regressions, Advanced Economies

	(1) 1974-2017	(2) 1974-1984	(3) 1985-1998	(4) 1999-2007	(5) 2008-2017
Growth	-.245 (3.79)***	-.535 (4.00)***	-.105 (1.57)	-.142 (2.71)**	.022 (.050)
Openness	.0074 (1.54)	.027 (1.48)	.053 (1.94)*	.038 (3.53)***	.015 (1.41)
Monetary Growth	.170 (1.69)	.165 (1.79)*	.082 (1.53)	-.0033 (.048)	.052 (1.32)
NOSC	-.035 (6.29)***	-.024 (2.61)**	-.040 (5.80)***	---	---
NOS	---	---	---	.018 (9.89)***	.043 (3.45)***
M	-.025 (3.60)***	-.008 (.92)	-.035 (3.93)***	-.0002 (.06)	+.000 (.000)
P	-.031 (5.85)***	-.016 (1.83)*	-.039 (4.52)***	-.0009 (.39)	-.004 (1.01)
Y	-.025 (3.39)***	-.017 (1.10)	-.035 (4.68)***	-.003 (1.23)	-.001 (.21)
PY	-.021 (3.50)***		-.032 (2.66)**	-.0005 (.21)	.002 (.42)
ECU	-.027 (4.56)***	-.008 (1.05)	-.033 (4.78)***		
Euro	-.014 (1.51)			-.009 (3.50)***	
DM	-.017 (2.83)***	-.016 (2.92)***	-.032 (3.23)***		
USD	-.044 (2.95)***	-.068 (10.73)***	-.034 (3.26)***	.0006 (.17)	
FRF	-.026 (2.90)***	-.014 (1.75)*	-.042 (3.66)***		
GBP	.015 (2.36)**	-.005 (1.08)			
SDR	-.021 (2.99)***	-.012 (.86)	-.015 (1.85)*	.	
Nobs	869	257	340	137	135
R-Squared	.65	.50	.57	.54	.66

Notes : Figures in parentheses are t-statistics calculated using robust standard errors (clustered by country); *, ** and *** represent marginal significance levels of 0.1, 0.05 and 0.001 respectively; Nobs=the number of observations in the estimated regression; R-squared refers to the 'within' R-squared under fixed effects estimation; ---indicates the benchmark stabilisation variable.

Table 8.2: Inflation Regressions, Emerging Economies

	(1) 1974-2017	(2) 1974-1984	(3) 1985-1998	(4) 1999-2007	(5) 2008-2017
Growth	-1.238 (6.14)***	-1.027 (3.81)***	-1.485 (4.07)***	-.468 (2.04)*	-.188 (1.93)*
Openness	.013 (.73)	.068 (.66)	.068 (1.25)	.037 (1.16)	.008 (.26)
Monetary Growth	.892 (16.33)***	.635 (4.01)***	.926 (12.04)***	.224 (2.22)**	.028 (.617)
NOSC	-.037 (2.98)***	-.054 (1.27)	-.022 (.65)	---	---
NOS	---	---	---	.038 (4.86)***	.021 (2.87)***
M	-.029 (2.35)**	.012 (.28)	.004 (.15)	.003 (.48)	.0002 (.05)
P	-.031 (2.03)*	.042 (1.57)	-.025 (.53)	.003 (.56)	.005 (1.50)
Y	-.012 (.78)		-.028 (.64)	.028 (4.40)***	.003 (.42)
PY	-.028 (1.02)			.006 (.74)	.006 (.92)
ECU	-.011 (.52)	.013 (.38)	-.0005 (.01)		
Euro	-.077 (1.90)*			.008 (.90)	-.001 (.17)
DM	-.044 (1.09)	-.008 (.25)			
USD	-.015 (.96)	-.020 (.72)	.061 (1.48)	-.006 (.56)	.009 (.89)
FRF	-.155 (2.87)***	.049 (1.63)	-.179 (3.28)***		
SDR	-.043 (1.80)*	-.053 (1.67)	-.075 (1.47)	-.0002 (.01)	-.007 (.78)
Nobs	1045	187	321	275	262
R-Squared	.85	.65	.82	.34	.42

Notes : Figures in parentheses are t-statistics calculated using robust standard errors (clustered by country); *, ** and *** represent marginal significance levels of 0.1, 0.05 and 0.001 respectively; Nobs=the number of observations in the estimated regression; R-squared refers to the 'within' R-squared under fixed effects estimation; ---indicates the benchmark stabilisation variable.

Table 8.3: Inflation Regressions, Developing Economies

	(1) 1974-2017	(2) 1974-1984	(3) 1985-1998	(4) 1999-2007	(5) 2008-2017
Growth	-.486 (3.40)***	-.311 (2.18)**	-.787 (4.17)***	-.215 (1.68)*	-.091 (1.79)*
Openness	-.047 (1.65)	-.007 (.11)	-.007 (.10)	.030 (.58)	.114 (1.49)
Monetary Growth	.748 (6.18)***	.555 (2.56)***	.870 (6.05)***	.227 (2.34)**	.078 (1.05)
NOSC	-.083 (7.60)***	-.115 (4.67)***	-.072 (2.26)**	---	---
NOS	---	---	---	.094 (5.93)***	.053 (7.92)***
M	-.028 (1.42)	-.048 (1.92)*	-.014 (.65)	.072 (2.72)***	-.013 (.47)
P	-.055 (3.75)***	-.055 (.72)	.007 (.19)	.019 (.68)	.010 (2.02)**
Y	-.065 (2.64)**				.006 (.61)
PY	-.039 (2.63)***				-.009 (.45)
ECU	-.033 (1.39)		-.083 (4.22)***		
Euro	-.022 (.76)			-.0004 (.02)	-.009 (.55)
DM	-.051 (1.94)*		-.335 (10.53)***		
USD	-.069 (4.05)***	-.061 (2.55)**	-.047 (1.72)*	.025 (1.33)	-.013 (.76)
FRF	-.006 (.25)	-.028 (.49)	.006 (.18)		
SDR	-.010 (.30)	-.021 (1.18)	-.043 (1.55)	.022 (1.01)	.072 (1.55)
Nobs	2972	453	834	774	911
R-Squared	.60	.48	.66	.18	.25

Notes : Figures in parentheses are t-statistics calculated using robust standard errors (clustered by country); *, ** and *** represent marginal significance levels of 0.1, 0.05 and 0.001 respectively; Nobs=the number of observations in the estimated regression; R-squared refers to the 'within' R-squared under fixed effects estimation; ---indicates the benchmark stabilisation variable.

Table 8.4: Growth Regressions, Advanced Economies

	(1) 1974-2017	(2) 1974-1984	(3) 1985-1998	(4) 1999-2007	(5) 2008-2017
Openness	.018 (2.04)*	.034 (2.35)**	.106 (3.79)***	.051 (8.05)***	-.021 (.81)
Gross fixed capital formation	.031 (.48)	.141 (2.11)**	.019 (.14)	.067 (.82)	.440 (2.88)**
Population	-.022 (.91)	-.130 (1.48)	-.108 (1.56)	.018 (.10)	-.477 (5.20)***
Population Growth	-.185 (.79)	-.665 (2.02)*	-.181 (.52)	-.664 (1.93)*	-1.283 (.76)
Schooling	-.005 (2.96)***	-.0002 (.02)	-.007 (1.28)	-.008 (2.47)**	
NOSC	.005 (1.51)	.014 (2.37)**	.006 (.006)	---	---
NOS	---	---	---	.006 (1.17)	-.030 (2.08)*
M	.004 (1.63)	.004 (.92)	.010 (2.02)*	-.008 (1.10)	.010 (1.76)
P	.009 (2.72)**	.006 (1.28)	.014 (3.04)***	-.004 (.67)	-.004 (.41)
Y	.006 (1.56)	.005 (1.37)	.014 (2.53)**	-.006 (.83)	.008 (.93)
PY	.009 (1.26)		.008 (.72)	.006 (1.18)	.004 (.79)
ECU	.012 (3.93)***	.004 (.88)	.019 (4.33)***		
Euro	.006 (.86)			-.003 (.51)	
DM	.005 (1.06)	-.008 (1.89)*	.013 (2.15)**		
USD	-.002 (.17)	.036 (10.81)***	.010 (.95)	-.017 (3.10)***	
FRF	.009 (1.88)*	.006 (.63)	.015 (2.88)***		
GBP	.002 (.43)	.023 (5.28)***			
SDR	.017 (2.88)***	.016 (1.82)*	.024 (1.89)*	.	
Nobs	822	275	349	128	70
R-Squared	.34	.33	.32	.55	.72

Notes : Figures in parentheses are t-statistics calculated using robust standard errors (clustered by country); *, ** and *** represent marginal significance levels of 0.1, 0.05 and 0.001 respectively; Nobs=the number of observations in the estimated regression; R-squared refers to the 'within' R-squared under fixed effects estimation; ---indicates the benchmark stabilisation variable.

Table 8.5: Growth Regressions, Emerging Economies

	(1) 1974-2017	(2) 1974-1984	(3) 1985-1998	(4) 1999-2007	(5) 2008-2017
Openness	-.002 (1.66)	.113 (1.57)	-.033 (1.52)	.033 (1.61)	.133 (2.24)**
Gross fixed capital formation	.196 (5.43)***	.006 (.08)	.342 (6.00)***	.196 (2.01)*	.467 (3.61)***
Population	-.025 (.81)	.076 (.34)	-.131 (2.34)**	-.040 (.61)	-.070 (.50)
Population growth	-1.104 (2.78)***	-1.779 (1.14)	.755 (.91)	-1.822 (5.40)***	-2.908 (1.68)
Schooling	.002 (.34)	-.032 (2.45)**	.016 (2.48)**	.014 (1.47)	
NOSC	.004 (.92)	.012 (.62)	.018 (2.46)**	---	---
NOS	---	---	---	-.002 (.47)	-.005 (.68)
M	-.004 (.74)	-.011 (.45)	.001 (.09)	-.006 (1.06)	-.005 (.42)
P	.002 (.40)	-.002 (1.59)	.021 (2.21)**	-.004 (.93)	.011 (1.07)
Y	-.003 (.42)		.022 (1.62)	-.007 (1.08)	-.010 (.95)
PY	.0007 (.10)			-.007 (1.03)	-.006 (.54)
ECU	.014 (2.30)**	.027 (3.24)***	-.008 (.70)		
Euro	-.019 (1.90)*			-.012 (1.77)*	-.035 (1.47)
DM	.0001 (.01)	-.016 (1.16)			
USD	.005 (1.00)	.015 (1.56)	.018 (1.63)	-.008 (1.20)	-.013 (1.09)
FRF	-.024 (.86)	-.034 (2.61)**	-.015 (.35)		
SDR	.016 (2.15)*	-.007 (.43)	.009 (.99)	-.006 (.85)	
Nobs	1039	231	368	296	144
R-Squared	.25	.23	.20	.38	.60

Notes : Figures in parentheses are t-statistics calculated using robust standard errors (clustered by country); *, ** and *** represent marginal significance levels of 0.1, 0.05 and 0.001 respectively; Nobs=the number of observations in the estimated regression; R-squared refers to the 'within' R-squared under fixed effects estimation; ---indicates the benchmark stabilisation variable.

Table 8.6: Growth Regressions, Developing Economies

	(1) 1974-2017	(2) 1974-1984	(3) 1985-1998	(4) 1999-2007	(5) 2008-2017
Openness	.016 (1.75)*	-.014 (.34)	.024 (1.18)	.032 (1.60)	-.022 (.47)
Gross fixed capital formation	.112 (3.97)***	.318 (3.80)***	.060 (1.08)	.012 (.27)	.133 (.99)
Population	-.010 (.61)	-.022 (.19)	-.008 (.16)	-.060 (.97)	-.018 (.15)
Population growth	-.224 (.78)	-.229 (.17)	.135 (.38)	-.444 (1.15)	-1.021 (2.54)**
Schooling	-.002 (.64)	.014 (.077)	.007 (.82)	-.004 (.36)	
NOSC	.009 (1.74)*	.007 (.52)	.007 (.66)	---	---
NOS	---	--	---	-.009 (1.73)*	-.009 (.71)
M	-.007 (.79)	-.015 (1.14)	.016 (2.64)**	-.030 (1.31)	-.013 (1.60)
P	.007 (.60)	-.006 (.07)	-.002 (.16)	-.016 (2.42)**	.016 (1.44)
Y	.002 (.18)				-.008 (.74)
PY					
ECU	-.036 (4.73)***		-.022 (2.18)**		
Euro	-.007 (.58)			.	
DM					
USD	.012 (2.43)**	.006 (.51)	.009 (1.46)	-.007 (1.42)	-.0003 (.03)
FRF	.004 (.36)		-.003 (.34)		
SDR	.013 (2.31)**	.020 (1.62)	-.0007 (.05)	.009 (1.55)	.020 (1.96)*
Nobs	2257	475	811	619	352
R-Squared	.11	.16	.05	.12	.21

Notes : Figures in parentheses are t-statistics calculated using robust standard errors (clustered by country); *, ** and *** represent marginal significance levels of 0.1, 0.05 and 0.001 respectively; Nobs=the number of observations in the estimated regression; R-squared refers to the 'within' R-squared under fixed effects estimation; ---indicates the benchmark stabilisation variable.

Figure 1: Advanced economies, variables most stabilised

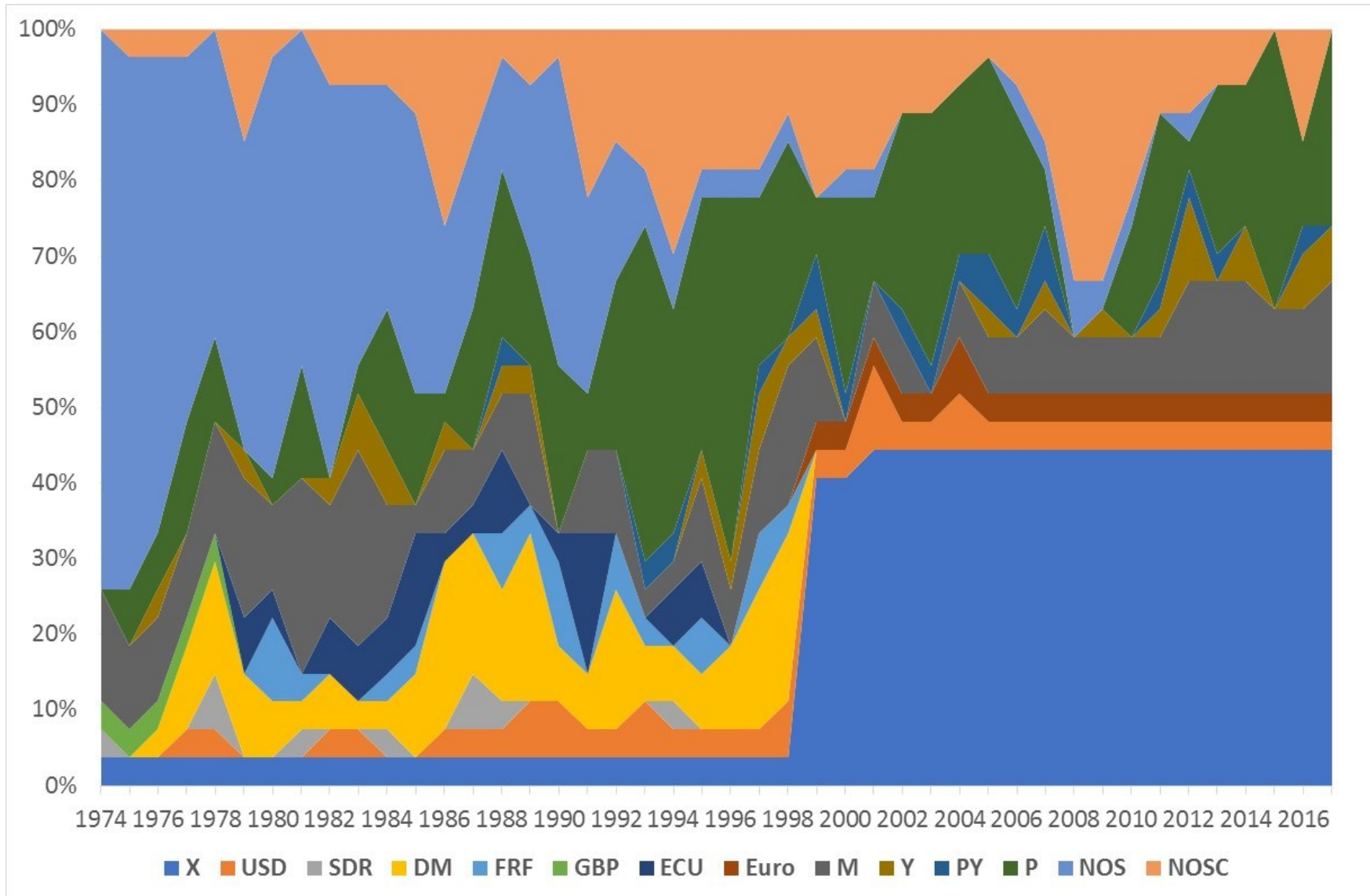


Figure 2: Emerging economies, variables most stabilised

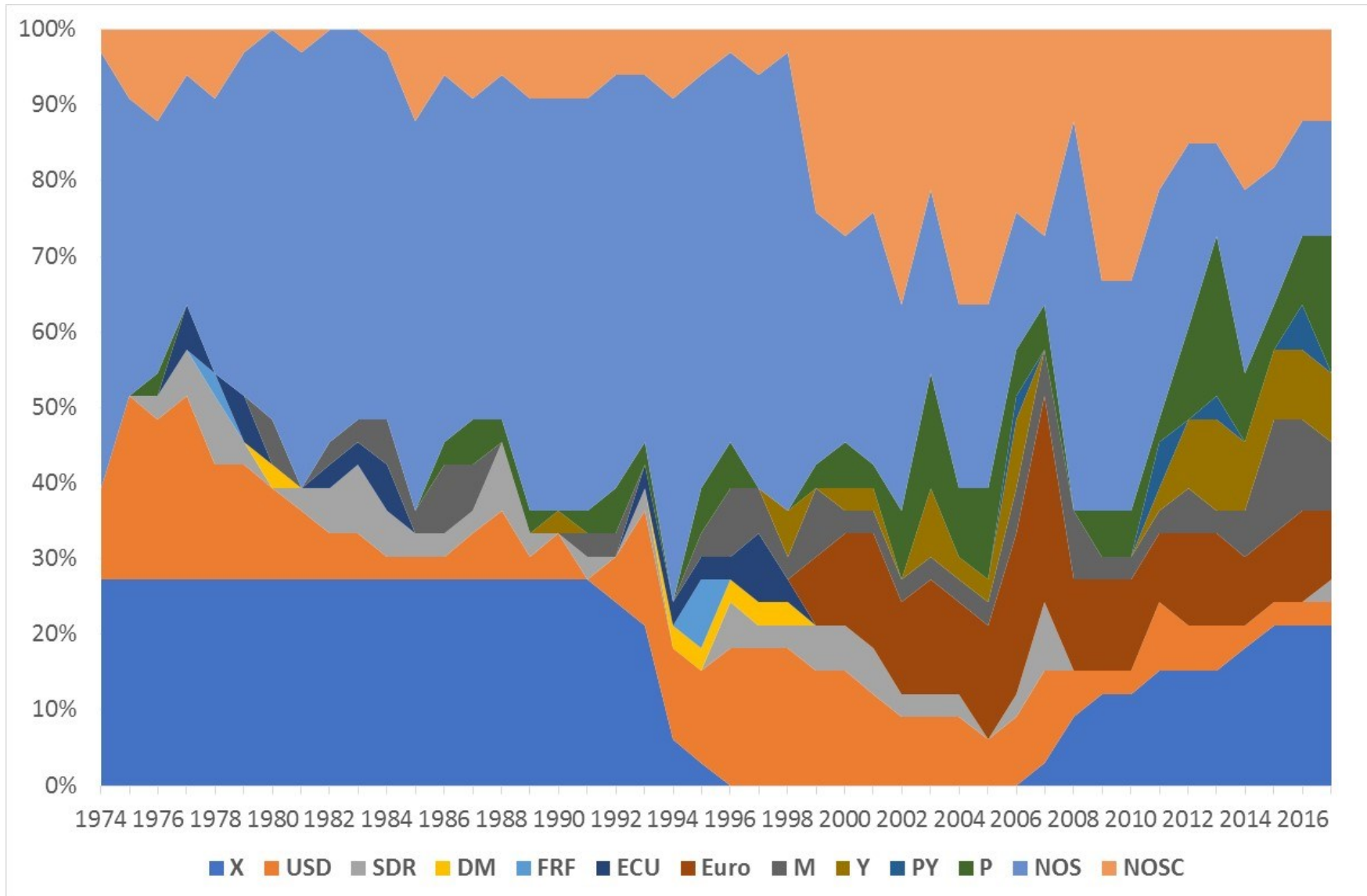
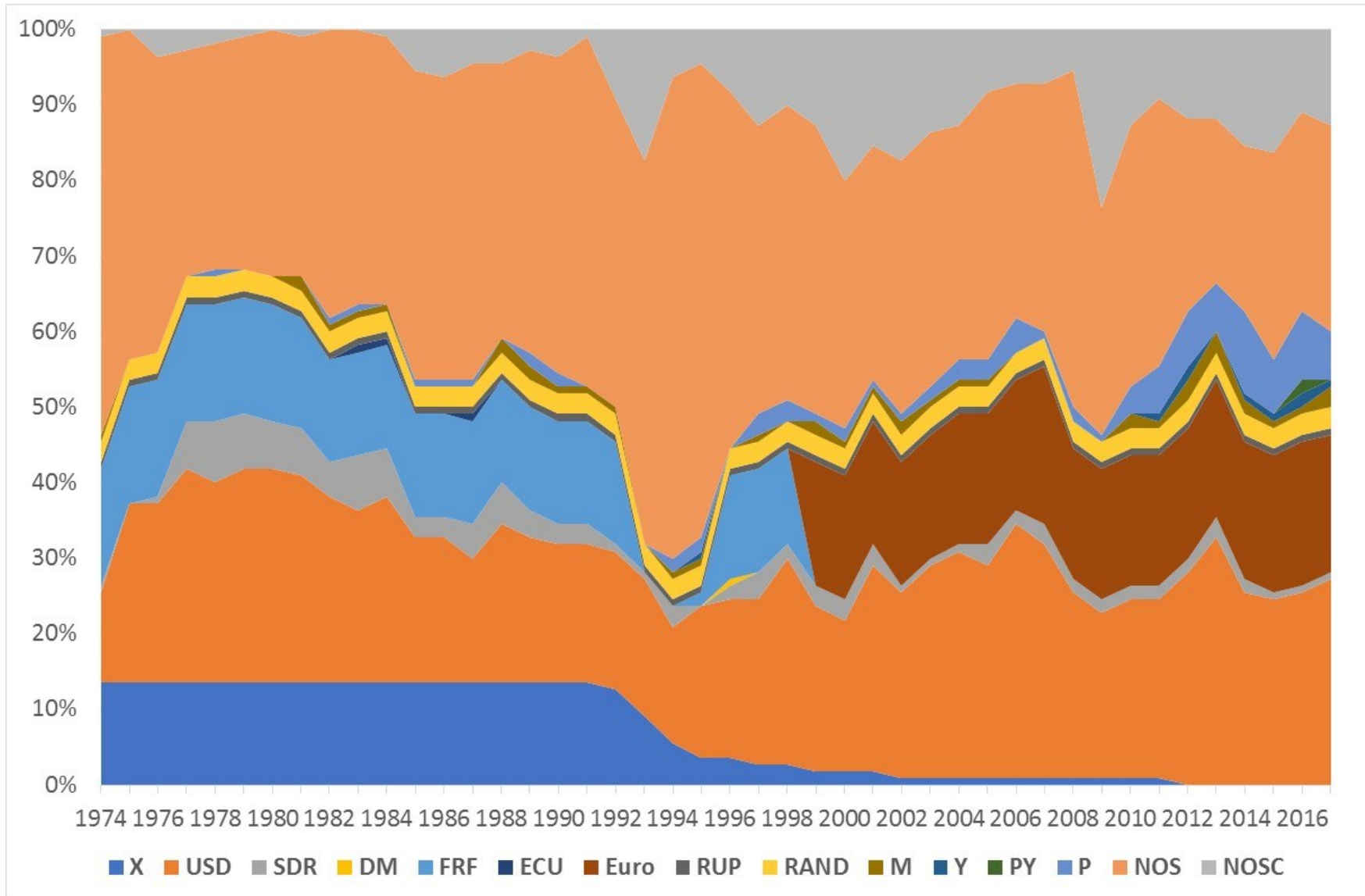


Figure 3: Developing countries, variables most stabilised



Appendix

Table A1: The various stabilisations, criteria and acronyms

stabilisation of growth of:	absolute criterion	acronym
prices	s.d. 4 quarter growth rate of prices < 0.5	P
money	s.d. 4 quarter growth rate of broad money < 1.0	M
real income	s.d. 4 quarter growth rate of real income < 0.5	Y
nominal income	s.d. 4 quarter growth rate of nominal income < 0.5	PY
Special drawing right	s.d. 4 quarter growth rate of SDR exchange rate < 1.0	SDR
US dollar	s.d. 4 quarter growth rate of USD exchange rate < 1.0	USD
Rand	s.d. 4 quarter growth rate of Rand exchange rate < 1.0	RAND
Rupee	s.d. 4 quarter growth rate of Rupee exchange rate < 1.0	RUP
Deutsche Mark	s.d. 4 quarter growth rate of DM exchange rate < 1.0	DM
French franc	s.d. 4 quarter growth rate of FRF exchange rate < 1.0	FRF
Pound sterling	s.d. 4 quarter growth rate of GBP exchange rate < 1.0	GBP
Ecu	s.d. 4 quarter growth rate of Ecu exchange rate < 1.0	ECU
Euro	s.d. 4 quarter growth rate of Euro exchange rate < 1.0	Euro
no exchange rate	no exchange rate criteria fulfilled	NER
no domestic stabilisation	no domestic criteria fulfilled and inflation \geq 5%	NDS
no domestic stabilisation constrained	no domestic criteria fulfilled but inflation < 5%	NDSC
no overall stabilisation	no exchange rate or domestic criteria fulfilled and inflation \geq 5%	NOS
no overall stabilisation constrained	no exchange rate or domestic criteria fulfilled but inflation < 5%	NOSC
not applicable	no specific national policy framework (country does not exist or uses a non-national currency)	X

Table A2: Data appendix

Identification of stabilisations		
Variable	Definition	Source
Price	Four quarter percentage growth of the CPI	IFS
Money	Four quarter percentage growth of broad money	IFS, supplemented in a small number of cases by data from central bank websites.
Real income	Four quarter percentage growth of real GDP.	IFS
Nominal income	Four quarter percentage growth of nominal GDP.	IFS
Exchange rates	Four quarter percentage growth rates of the end of quarter official or market rates.	IFS
Unconditional analysis		
Inflation	As above, averaged over four quarters of calendar year	WDI
Growth	Real per-capita growth, annual data	WDI
Conditional analysis		
Inflation	The logarithm of 1 plus the annual percentage change in CPI	WDI
Growth	Growth in annual GDP (constant 2010 US\$)	WDI
Openness	Exports plus imports as a percentage of GDP	WDI
Monetary growth	The logarithm of 1 plus broad money growth.	WDI
Per-capita growth	Real per-capita GDP growth (constant 2010 US\$)	WDI
Gross fixed capital	Gross fixed capital formation as a percentage of GDP.	WDI
Population	Logarithm of population	WDI
Population growth	Annual percentage change in population	WDI
Schooling	Average years of schooling of the population aged 25 years and over (missing data interpolated).	Barro and Lee (updated)

Notes: CPI is the consumer price index and GDP is gross domestic product. *World Development Indicators* (WDI) available at <http://databank.worldbank.org/data/>. IFS, International Financial Statistics from the IMF. Barro and Lee Dataset from <http://www.barrolee.com/data/full1.htm>.