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Argentina's Avoidable Crisis: Bad Luck, Bad Management, Bad Politics, Bad Advice

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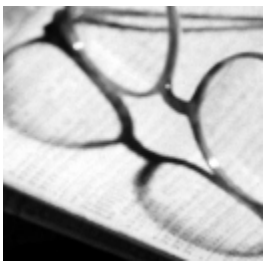

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Argentina's Avoidable Crisis:

Bad Luck, Bad Economics, Bad Politics, Bad Advice

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1. Introduction: a description of the events

I recently renamed this paper, to counter the growing trend of papers that suggest that the Argentine crisis was inevitable. In what follows, I claim that while the currency may have been over-valued by conventional measures, especially after the devaluation of the Real, the current account had more or less adjusted by the end of 2000. I suggest that until the end of 2000 and, arguably even until the second quarter of 2001, the fiscal adjustment that Argentina certainly had to do was actually relatively mild but that Argentina did virtually none. The real roots to the crisis then had much more to do with Argentina than with the particular exchange rate regime and the difficulties in effecting a relatively mild fiscal adjustment.

In my view the crisis was avoidable and one can even point to key events and decisions at particular moments of time. If some combination of these events had turned out different, it is likely that crisis would have been avoided. For example, if Argentina had managed to renegotiate the tax sharing agreement between the Provinces as the Constitution demanded, if Argentine federal public sector savings had been higher in 1996-1998, if the Peronist Party had not been split down the middle in 1998/9, if the Radical Party had had an outright majority in the new Government in 1999, if the new Alianza Government had reduced (the right) expenditures immediately, if the Radical Party had actively ditched Freepaso pre-emptively and sought an alliance with "moderate" Peronists and others, and if the Lopez Murphy plan had been endorsed, all would have reduced the probability of default significantly.

In my view the root of the crisis was then the interaction between bad luck, a moderate but certainly required fiscal adjustment, a slow deflationary and recessionary current-account adjustment process and, very importantly, extremely messy politics - and

hence the inability to reduce national spending without creating enormous political uncertainty. These interaction effects can also be thought of as vicious, self-enforcing cycles, and hence suggest potential multiple equilibria, both within the economic variables and also between the economy and the politics.

Different authors have criticised the role of the IMF in Argentina and indeed have criticized particular decisions. The characterization offered here is that the Fund was in an impossible position - and will be in the same impossible position faced with the next country in a similar trap. It is suggested that on the one hand the IMF became increasing uncomfortable with the policies that Argentina adopted - especially in 2001 as the limits to orthodox fiscal adjustment became clearer and other directions were tried – but at the same time knew that if it withdrew support, then that would create the conditions for a private sector run that would have ended (as it eventually did) in default and probable devaluation. The IMF was then caught between a growing concern regarding moral hazard and the possibility of a massive run that would create a crisis much deeper than actually "warranted" given the underlying problems in the economy. This more structural explanation to the difficult role of the Fund, suggests that the international financial architecture is still incomplete and that further creative thought is required to contain the incentives for countries in such an unfortunate position to pursue more risky policies as default becomes more likely.

The current economic crisis in Argentina can be traced back to at least mid-1998; the period when private investment began to decline and the economy began to slow more

rapidly.[2] At this time Argentina suffered a set of external negative shocks that might have rocked any economy. This section is roughly chronological however this chronology also, roughly, corresponds to (i) the luck runs out, (ii) politics gets messy (iii) politics drives economics or vice versa and (iv) on the role of the IMF – the sub-headings of this section.

(i) The luck runs out

While the Asian crisis largely left Argentina unscathed, with a sharp but temporary hike in risk spreads with the attack on Hong Kong in October 1997, the effect of the Russian default was a different story altogether. The strong rise in the overall EMBI spread led to a significant impact on Argentina affecting capital inflows and investment. Figure 1 shows overall EMBI and the Argentine EMBI.[3] Argentina's persistent current account deficit reflected a dependency on international capital flows to foster growth. After many years of an open investment regime, the majority of the top 100 companies in Argentina were under foreign ownership and a significant percentage of domestic fixed investment thus accounted for by foreign owned companies. The currency board, the open capital account and the structure of investment made the pass-through from measures of country risk, to real investment more direct than in many other emerging countries.

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[2] Some might argue that they can be traced back to 1991 and the Convertibility regime itself but then the origins of that regime would have to also be contemplated. Indeed, some might consider that the origins of this crisis were in effect the same as the problems that have dogged Argentina throughout the second half of the twentieth century. In this paper I only consider the origins since 1998. It is then a maintained assumption that the crisis was not inevitable given the 'initial conditions' at that time.

[3] The high correlation is not explained by Argentina's relatively high participation in the index.

In 1998, Argentina also suffered a sharp decline in the terms of trade mainly as a result of significant falls in agricultural prices and, in addition, a deepening recession in Brazil –Argentina's main trading partner accounting for about 30% of exports. A further significant shock hit Argentina in January 1999, with the eventual devaluation of the Brazilian real. Argentine exports to Brazil were further strongly affected although the feared cheap imports, from Brazil to Argentina, never really materialised. Moreover, Argentine exports appeared to recover reasonably well, towards the end of 1999, with the recovery of the Brazilian economy - although still below the 1998 levels. Finally, given the exchange rate regime, the US dollar's strength clearly did not help Argentina either in exporting to Europe (the second market after Brazil) or in competing with others in exporting to the US market (the third export destination). While exports grew virtually every year over Convertibility, these factors ensured that export growth was limited. In Figure 2, we plot Argentine exports and imports and the trade balance.

(Figure 1 Here)

Pou suggests that 1999 is a critical year to analyse as in the second half Argentina actually grew at an annualised rate of x% and the author claims that it is incorrect to consider the whole period 1988 to date as continuous recession.[4] The growth in 1999 is surprising to say the least given the Brazilean devaluation in January of that year, the supposed over-valuation of the Argentine peso and the deflationary adjustment that Argentina was undergoing. A possible explanation is a fiscal stimulus in part due to the electoral campaign, but Perry and Servén find little fiscal stimulus at the Federal level –

[4] Pou (2002).

about 1% of GDP - although the Province of Buenos Aires also increased expenditure by some $2bn over the year.[5]

(ii) Politics gets messy

Late 1998 and 1999 coincided with the start of a period of particularly messy politics. First, the end of then President Menem's second term in office heralded a waning concentration of power and more fractious politics. A common view was that many of President Menem's actions during his second term were aimed ultimately at changing the constitution to allow for a third term, creating a sharp divide within the Peronists Party between those that appeared to go along with this bid and those that did not -with subsidiary fights within the latter camp regarding a successor – and stalling any further major economic reforms.

(Figure 2 Here)

In October 1999, President De La Rúa was elected President at the head of the Allianza, an alliance between the Radical Party and a smaller party, Frepaso - beating the chosen Peronist candidate, Duhalde - the ex. Governor of the Province of Buenos Aires. The political campaign was a quite extraordinary one as Duhalde had been leading the polls markedly earlier in the year. However, 'defeat was snatched from the jaws of victory', in

[5] Perry and Servén (2002). In the analysis presented below, it is argued that the current account was far from sustainability during 1999 such that if a sharp (possibly electoral) fiscal stimulus is not the answer then this growth would indeed remain something of a mystery.

part due to the decision of the Peronist candidate to focus on the debt position and his open call for a re-negotiation of the foreign debt.[6]

This stance did not help relations with then President Menem and Duhalde criticised Menem for undermining his campaign. The debt position had certainly worsened, arguably as a result of the political campaigns themselves, but the reaction of most Argentines to Duhalde's call for debt re-negotiation was that such a move would threaten Argentina's hard-won economic stability. The voters rejected it.

Another interesting feature of the campaign was the rumour that Domingo Cavallo might forge an alliance with Duhalde – the former headed his own political party: "Acción Por la República". To some extent this may have been aimed to calm the nerves of those that were concerned about Duhalde's more populist political rhetoric. In July 1999, Cavallo gave an interview to the Financial Times, where he suggested that eventually the peso might float. Although the body of the article made clear that his view was that this would only happen from a position of strength, the title of the piece was leading to say the least. In a precedent of things to come, the markets reacted strongly pushing country risk up significantly.[7]

President De la Rúa took office in January 2000. The reaction of the private sector to the new Alianza Government was one of suspicion and might best be described as 'wait and see'. The suspicion stemmed from a number of factors. These included (a) rumours

[6] While Duhalde started to talk about debt renegotiations earlier and La Nación newspaper ran the story that he visited the Pope in part to discuss debt relief the Argentine Banking Association (ABA) conference in July 2001, provided a major platform for Duhalde's position.

[7] Indeed in an 'event study' of how currency risk affects country risk covering many years and countries, Powell and Sturzenegger (2002) find that this event was significant.

regarding the personality of the President himself, (b) the history of the Radical Party in power (the last experience led to the early resignation of President Alfonsín in 1989 amidst economic crisis), (c) the nature of the alliance (the Freepaso party did not appear to share many of the views or policies of the De la Rúa wing of the Radicals) and (d) the Alianza did not have a majority in Congress but had to negotiate with the opposition Peronists to pass virtually all legislation raising issues of 'governability'.

(iii) Politics drives economics or vice versa?

As the economy stagnated and tax revenues started to fall, President De la Rúa's first economy minister, Jose Luis Machinea, decided on a significant increase in taxes. This became known in Argentina as the first "impuestazo" (after the Spanish for tax, "impuesto"). The idea was that with a significant increase in taxes (easier politically than reducing expenditure), the fiscal deficit would be narrowed and the private sector would feel more comfortable about the sustainability of the debt and also about the responsibility of the Radicals in power. More orthodox economists argued that this would then reduce country risk, reduce interest rates and aid recovery. Unfortunately, the "impuestazo" had a significant negative effect on activity that appeared to outweigh these potentially positive aspects. Indeed, the negative effect on activity could be seen after the announcement of the package, in early 2000, even before taxes had actually risen.

During 2000, there was a new piece of 'bad luck'; namely the fall in Nasdaq. Moreover, further internal political squabbles ensued as the proposed 'austerity program' angered the left wing of the Radicals, lead by ex President Alfonsín and members of Frepaso, such that the governing coalition appeared to be at continuous breaking point. Governability problems appeared paramount, the real economy did not recover and the

private sector only saw their 'wait and see' attitude vindicated and indeed they became more pessimistic. The IMF program based on reasonably optimistic scenarios for GDP implied that many observers thought that the fiscal deficit targets were difficult to meet. Eventually, certain expenditure reducing policies were also effected, including a reduction in public sector salaries in an attempt to maintain reasonable deficit figures despite falling revenues and to stay within the IMF program. Also, notably a labour reform bill was passed - although with significant political cost. Towards the end of 2000, the continued political squabbling manifested itself in the resignation of the Vice-President and the leader of the Freepaso party putting the future of the alliance in further doubt.[8]

Through 2000, a double vicious cycle developed. On the one hand a purely economic cycle included depressed economic activity negatively impacting tax revenues worsening the fiscal deficit, increasing concerns about debt sustainability, pushing country risk spreads and interest rates higher and reducing investment feeding back to depressed economic activity. A second vicious cycle developed from the economics to the politics and back to the economics. The worsened fiscal position led to calls for 'adjustment' and heightened political squabbling as suggested 'adjustments' in terms of tax hikes and expenditure reductions hurt interested parties. In turn the political squabbling also increased country-risk as the market perception was that Argentine politics was such that the necessary adjustments to make the fiscal position sustainable might not be forthcoming. In Figure 3, we plot growth, fiscal revenues and the EMBI+ index for Argentina over 2000 and 2001.

[8] The resignation of the Vice President was also a consequence (at least ostensibly) of a bribery scandal in the Senate where it was alleged that Senators accepted payments to support the passage of a labour reform bill.

(Figure 3 Here)

At the end of 2000, and as stronger doubts began to emerge on the sustainability of the debt, Minister Machinea negotiated a support package from the IMF, other multilaterals, private banks and the Spanish Government to ensure funding for the following 12-24 months. This was known as the 'blindaje' and included a substantial IMF contribution.[9]

The 'blindaje' appeared to calm the nerves of international investors - at least temporarily. However, there was concern about the real commitment of the private sector 'market makers' to roll over the debt and also there were doubts regarding the promised IMF support - again conditional on fiscal targets based on reasonably optimistic growth forecasts. Indeed, one interpretation is that the Argentine private sector simply did not believe in the promised recovery, or the 'adjustment'. These doubts were not helped by the resignation of Jose Luis Machinea in March 2001 after a period of sustained political pressure. While one (generous) interpretation was that, having spent his political force in forging an agreement to obtain the 'blindaje' it would be better for the country if someone else now took the economic reins to implement it; a less-kind interpretation was that Machinea himself did not really believe that the recovery and/or adjustment was possible and wanted out while the going was good. Machinea was replaced with Ricardo Lopez Murphy. Lopez Murphy had a reputation as a strong fiscalist and indeed had been a strong original candidate for Economy Minister but had made himself unpopular amongst sections

[9] 'Blindaje' means armour in Spanish and this conveys well the idea that the package was to protect Argentina from speculative attacks or 'runs' due to a lack of confidence about the liquidity position of the public sector. The total package was advertised as $30bn and the IMF contribution $15bn – see Mussa (2002) for details.

of the Radical Party by calling openly for cuts in public sector wages - which eventually Machinea had implemented.[10]

Lopez Murphy's plan included an immediate cut in public sector expenditure with cuts in areas that directly hurt key and powerful lobbies that supported De la Rúa within the Radical Party, including education. One might speculate that this was a deliberate strategy on the part of Lopez Murphy to signal to the markets that he meant business and to the De la Rúa Government that he should be allowed to do anything he wanted - or he would leave. The result was that he left. Lopez Murphy failed to convince his own party that these measures were really necessary and following a political storm, heralded by the resignation of the Minister of the Interior, he was forced to resign.

Lopez Murphy was replaced with Domingo Cavallo who left his own political party to become the Minister of the Economy for the second time. Cavallo´s strategy appeared to be quite different, to that of Machinea or Lopez Murphy as his focus, at least initially, was not on orthodox fiscal measures, but on more heterodox policies to try to get recovery. Perhaps he calculated that his reputation for sound economic management during his first period as Economy Minister (1991-1996) was sufficient to allay the fears that Argentina might move back to more market unfriendly measures. These heterodox measures included pressuring the central bank to relax banking regulations (relaxing 'monetary policy' as he referred to it), introducing subsidies for particular sectors (through a scheme named the competitive plan or 'plan competitividad' in Spanish) and trying to get more flexibility within the exchange rate regime as we discuss below. A financial transaction tax was also

[10] Lopez Murphy was originally appointed as Minister of Defence.

introduced which, being reasonably easy to actually monitor, helped to reduce substantially the fiscal deficit and arguably made the total package roughly revenue neutral.

However, two issues towards the start of Cavallo's new term resulted in sharply increased country risk. The first was a fight with the Central Bank and the eventual removal of the Central Bank President. The second was the change in the Convertibility Law to include the Euro (once the Euro achieved parity with the US$) in the basket to fix the Argentine peso within the currency board regime. On the first issue, the Central Bank moved slightly in the direction of relaxing bank regulations but it was clear that it would attempt to resist further changes. The analysis from the Central Bank was that measures to loosen 'monetary policy' would not work as the problem was a lack of demand for credit not a problem of supply and that indeed, by effectively reducing Central Bank reserves this would simply weaken confidence and hence demand further. Pedro Pou, then Central Bank President, also made clear his objection to the introduction of the Euro into the currency basket and indeed publicly favoured dollarization rather than increased flexibility.

At the same time, Pedro Pou faced a 'political inquiry' into his conduct that had focussed mostly on the handling of several bank closures and other miscellaneous 'charges'.[11] As no court had pronounced against him with respect to any of these cases, the inquiry had to be a 'political' one, and no statements regarding legal wrong doing could be alleged by the investing congressional committee. The charter of the Central Bank states

[11] These 'charges' included assisting banks too much before they were eventually closed, but also suggesting that banks were not assisted enough. They also included references to money laundering (or that the central bank had not done enough to stop it) and also argued that the central bank president by talking favourably about dollarization was not defending the local currency (the charter of the central bank states that defending the value of the local currency is the central bank's first objective).

that the Central Bank is independent but allows the President of the country to remove a Central Bank president after the formation of a congressional committee and upon its recommendation. While a Central Bank President can be removed after some judicial process has proven guilt it was also argued that the relevant clause allowed for dismissal if the relevant committee discovered 'misconduct' - with the final decision resting with the President. In the end, the congressional committee recommended removal and President De La Rúa signed the relevant decree making a mockery of the independence of the institution. This process clearly eroded the already shaky reputation of institutions in Argentina.

It is perhaps ironic that the plan to introduce the Euro into the basket met with such a hostile reaction from the markets. After all, the markets appeared to have been calling for increased flexibility and this could have been interpreted as one way to get it – and without sacrificing the discipline of the currency board. However, the market's interpretation was that if this change to the Convertibility Law (previously thought sacrosanct) could be made so easily, then other changes might also be introduced with ease. While Cavallo, consistently stated that there would be no devaluation, this did not appear to calm the markets.[12]

The country-risk, over this period, reached 1000 basis points over US Treasuries and was clearly unsustainable. A huge debt swap was then launched known locally as the 'mega-canje' (canje being Spanish for swap). Indeed this still stands as the largest debt swap in history. It covered bonds issued internationally although the majority of those that

[12] There is also a view that Cavallo pushed the change in the Convertibility Law at that time for political motives to demonstrate that Convertibility was not the same as dollarization - after all it is difficult to explain the timing of the proposed change in terms of pure economics.

participated were local residents. Still, there was a significant international tranche. The mega-canje represented a clear trade off. It pushed out the debt profile, extending the maturities and reducing the debt service in the coming 12-36 months. However, the effective interest rate on the swapped debt rose. While the swap improved the Government's liquidity position, the general conclusion was that it worsened its solvency.[13] On the anticipation of the mega-canje, the EMBI+ did drift higher (lower spreads) but fell on its announcement with, perhaps, some (small) net gain. This suggests that the operation did reduce default risk, at least up to the duration of the EMBI+, but that the market was disappointed by the terms.

Through June and July, the increasingly uneasy relationship between Cavallo and the, largely Peronist, Provincial Governors generated much noise. However, the cause may well have been economic factors. On the one hand, arrears in tax revenues that the Federal Government was supposed to share with the Provinces, had built up. On the other hand, there were reports that banks were refusing to rollover loans to the Provincial Governments putting further pressure on Provincial finances. Also, and perhaps more importantly there was still no good news on economic activity, fiscal revenues remained depressed (in part no doubt affecting the Government's willingness to share the tax revenues), and it seemed that the magic of Cavallo was not working, this time around, to get the economy moving.

On June 15th, perhaps as part of these pressures, a de facto "dual exchange rate regime" was announced but which operated through a system of variable export, subsidies and import tariffs. The scheme cleverly brought forward the policy of bringing the Euro

[13] Mussa (2002) characterises the mega canje as an, "act of desperation".

into the basket for trade-related operations while keeping the exchange rate fixed for financial transactions.[14]

(iv) On the role of the IMF

At the time of its announcement, there was a very serious concern that this measure might cause the IMF to withdraw its support and effectively stop the program. However, the Argentine authorities (successfully) argued that the system was not a dual exchange rate, but a system of export subsidies and import tariffs where the rates of those subsidies and tariffs happened to operate through the movement in exchange rates.

The markets reacted very unfavourably indeed to the measure, in large part due to the uncertainty that this policy created with respect to the IMF program. This interaction is crucial to an understanding of events in Argentina. The IMF had previously signalled its displeasure to the change in the Convertibility Law. It appeared to suggest that the mega-canje had been positive but the only weak-worded support, for many, indicated that the Fund was just going through the motions.[15] A common view was then that the de facto dual exchange rate might be the final straw to break relations with the Fund. If the Fund withdrew, many investors calculated that there would most likely be a run on the banks and hence the possibility for further government financing would be dissipated. Maintaining engagement with the IMF was then crucial to Argentina finding some 'orderly' solution to its problems.[16] The perceived displeasure of the Fund then increased nervousness among

[14] The export subsidies and import tariffs were calculate on the basis of the Dollar-Euro exchange rate.

[15] See the discussion in Mussa (2002).

[16] This interaction between the Fund and the private sector is incorporated into the simple game presented in section 4 and Appendix 2 below.

private investors. As country risk rose, the financial system also started to lose deposits again.

Perhaps as part of the negotiating strategy with the IMF to increase the chances of an early disbursement and in part due to the worsened fiscal position, a zero deficit policy was announced. The announcement came on July 15th, and the reaction by the market, was an extraordinary increase in risk spreads by some 400 basis points to over 1600 basis points.[17]

It is at first sight difficult to explain this very negative market reaction. It might be argued that the plan was not credible, but that would explain only the lack of a positive reaction, not such a pronounced negative one.[18] Joyce Chang commenting on this paper suggested that the market had actually expected a greater adjustment, or perhaps a more detailed plan, and was disappointed by the announcement. Pablo Guidotti suggested at the time that not only was the plan not credible but that also that the announcement revealed that the situation was much worse than many market observers believed.[19]

Related to this view is an explanation based on how the plan was announced. The announcement stressed that a zero deficit was not really what Argentina wanted, but one that had been forced on the country - as there was no further access to credit. At a time when the IMF had given no real indications that further funds would be forthcoming, there was now an admission that there was no prospect of any private sector funding either. In the terminology of game theory, this might be thought of as an event that changed the degree of 'common knowledge' among investors. While each individual investor may have

[17] Approved by Congress on July 30th.

[18] I am indebted to Federico Strurzenegger for this observation.

[19] See Guidotti (2001).

been reticent to lend to Argentina, each individual investor was not absolutely sure what the view of another investor was. And the second investor did not know for sure what the first investor knew about the second etc. The announcement by the Argentine authorities themselves confirmed what many might have thought but did not know for sure: that no private investor was now prepared to fund Argentina! This then became 'common knowledge'.[20]

This announcement switched a bad situation into a terrible one and served as the trigger for the run from the financial system. Of course, it is likely that the private sector was already hovering to select this 'bad equilibrium' given the series of 'bad news' and especially given the doubts regarding the continuance of the IMF program. The 'run' can be seen clearly in Figure 4 where we graph private sector bank deposits. Still, this run from the banks was mostly, but not entirely, institutional investors and the more sophisticated (and larger) private depositors.

There then followed a couple of tense weeks and negotiations with the IMF as banking sector deposits fell and country risk hovered at between 1400 and 1700 basis points. Despite repeated Government announcements, there was significant uncertainty in Argentina whether a package would be agreed and what any package would look like. Many suggested that the IMF, or the US, would call for Private Sector Involvement as part of any agreed package. This, of course, only added to investor concern. Finally, an agreement with the IMF was reached on August 21st and as can be seen from Figure 4,

[20] See Binmore (1992) and the account of ´Bob's your uncle' regarding who has a dirty face in a Victorian railway carriage – and the remainder of Chapter 10 - for an excellent account of 'common knowledge'.

which plots banking sector deposits, this clearly arrested the deposit run and also brought down country risk - but only to 1400 basis points.

The agreement with the Fund was a strange animal indeed.[21] It included about $5bn of new money to shore up Central Bank reserves and $3bn that was there to assist Argentina in some future (unspecified) debt restructuring.[22] At the same time the Contingent Repo. Facility of the Central Bank was called, allowing a further $1.2bn increase in reserves at that time, from private sector international banks plus, a further $1bn of World Bank and Inter American Development Bank disbursements ($500m from each institution) as enhancements to that facility.[23]

Over the subsequent month or so, banking system deposits stabilized but the run of some $8bn, or over 10% of deposits, and the very high continuing risk-spreads implied a credit crunch that hit the real economy hard. This credit crunch was concentrated on the private sector and moreover a private sector that had lost access to the international capital market. As the very poor fiscal revenue figures for September became known, risk spreads rose again. It looked increasingly clear that Argentina would now miss the fourth quarter fiscal target with the IMF - and be far away from the zero-deficit as promised. This, once again put in jeopardy the agreement with the Fund. After the August package, the debate was now whether Argentina would get any more money from the IMF at all.

There was also a realization that the Argentine Government was going to have no choice but to restructure its debt again – both domestic and foreign – and there was a

[21] See Mussa (2002) for more details.

[22] To date the $3bn has not been disbursed.

[23] The Facility has since been fully repaid to the private sector. Repayments to the multilaterals have followed their particular amortization schedules.

growing perception that the Fund was going to require this before any new money arrived. Initially the announcement was to seek a voluntary restructuring. However, it was not clear how this was going to be done. While domestic investors, including regulated banks and regulated pension funds, might be coerced into a restructuring that could be presented as at least quasi-voluntary, it was not clear how this was going to be achieved with non-regulated and international investors. Tellingly, official terminology changed from seeking a voluntary debt restructuring to seeking an orderly one. Country risk rose accordingly to over 3000 basis points by November 20th.

As it became a more widespread view that the IMF would seek this restructuring (now read default) before a new agreement was reached, there was also a growing realisation what such a restructuring implied for domestic banks' balance sheets. Domestic investors became more and more nervous and not surprisingly the decision of increasing numbers was safety first; shifting money abroad, or placing dollar-bills in safety deposit boxes or simply under the mattress. A full-scale run developed in the financial system once again.[24]

In fact, the causality between the Run on the banks and the Run on country risk was not entirely clear as there was also a growing realisation by international bond holders, that if domestic banks lost funding then the Government also lost funding, and hence any haircut applied to international investors would be greater. And as bond prices fell, the solvency position of banks, heavily exposed to the sovereign, looked more and more shaky

[24] The final trigger for the severest run on the banks was a measure that effectively limited the interest rates that banks could pay on new deposits; The 'Comunicación A 3365' from the Central Bank from the 26/11/01 established 100% reserve requirements on deposits paying an interest rate higher than specific reference rates.

alarming deposits. While deposit-holders watched country risk, international bondholders monitored deposits in the local financial system. The causality most likely ran both ways.[25]

The authorities at that time then had little room for manoeuvre and controls on deposit withdrawals and also capital controls to limit the outflow of capital from the country were swiftly imposed. This set of controls became known as the 'corralito'.[26] The 'corralito' was deeply unpopular with those that got trapped and, to a large extent helped to

[25] This account reflects the author's view that the banking system was essentially a victim of the macroeconomic situation and not a major cause of the instability in itself. Perry and Servén (2002) appear to suggest otherwise and that the strict Argentine banking regulations were a "façade". This is not the place for a detailed discussion, suffice to say that the capital requirements in Argentina included many add-ons to Basel standards that effectively did protect banks against extra risks including risks in the non-tradeable sector that are not discussed. Pou (2002) suggests that Argentine banks could have withstood a 40% devaluation (close to Perry and Servén's estimate of peso overvaluation) without difficulty. In my view, these authors are right to criticise the relaxation of certain regulations through 2001 but otherwise the criticisms are misplaced. Banking regulations are like seat belts; extremely useful to protect against 30mph crashes, but provide little protection if the car is driven off a cliff! To be safe, the car should not leave the garage, i.e.: a banking sector that only invests in AAA paper. The more interesting questions not tackled by these authors relate to the optimum ex ante trade-off between strict banking regulations and the degree of credit formation in an economy. The overall lessons from Argentina with respect to financial systems are well known; 1) that financial stability is extremely vulnerable - even with initially very high liquidity and solvency ratios -when the macroeconomic policy framework does not add up and 2) there is a fine but important distinction between 'counter cycle policy' and 'gambling for resurrection'.

[26] This name refers to a type of corral that cattle are herded into and then, after queuing, are with luck allowed out one at a time having been washed, injected or having suffered some other indignity. If they are less lucky, they leave the corral one at a time onto a truck to be taken to slaughter.

provoke the "cacerolazo" of the middle classes.[27] Together with the more serious demonstrations, riots and attacks on supermarkets and other stores, the more peaceful cacerolazo led to the downfall of first Minister Cavallo and, subsequently, the De La Rúa Government. Since that date, Argentina has formally defaulted (under ex President Rodriguez Sáa) and devalued (under the current President, Duhalde). His devaluation was accompanied by a forced and asymmetric 'pessification' of dollar contracts within the financial system such that dollar deposits were converted to pesos at the exchange rate of 1.4 to 1, loans were converted at 1:1. At the time of writing (July 2002), Argentina is still attempting to resolve the problems in the financial system and lift the banking controls and has not commenced to renegotiate the external debt.

2. Four Hypotheses

This description of events raises a set of potential hypotheses that might explain the proximate roots of the Argentine crisis.[28] In this section I attempt to describe these hypotheses more analytically and in the following section attempt to test them empirically. I focus on 4 potential hypotheses; namely: (1) Fiscal Unsustainability, (2) Current Account Unsustainability, (3) Political Risk, (4) Multiple Equilibria.[29]

A. Fiscal Unsustainability

[27] Cacerolazo refers to the mass beating of casserole dishes and other kitchenware in a noisy but largely peaceful demonstration.

[28] As noted above, the true roots of the crisis may of course lie many years before. In this paper we assume that the crisis was not 'inevitable' but that events post, say, 1997 made the crisis a reality.

[29] These hypotheses are not mutually exclusive but indeed may be complementary and mutually re-enforcing.

Argentina defaulted in January 2002 and hence by definition at some point there was a problem of fiscal unsustainability. It is difficult to pinpoint exactly when the debt position became clearly unsustainable and readers may have their preferred dates.[30] While the date at which things became unsustainable is an interesting question, the real question posed here, however, is was fiscal unsustainability the underlying cause of the crisis or was it something else that resulted in fiscal unsustainability? As we discuss below, competing causes include a lack of growth for some other reason (due to an external constraint or high political risks) that then made the fiscal position unsustainable.

Argentina has been plagued by fiscal problems throughout much of its recent past and indeed it would strange if fiscal sustainability was not an issue in this crisis. Throughout the 1980's the fiscal, and quasi-fiscal deficit, played a significant role in driving price expectations towards eventual hyperinflation. Prior to the adoption of the currency board, an attempt was made at a significant fiscal reform but this still did not lead to exchange rate (and money demand) stability. Indeed, the establishment of the currency board itself could be traced back to Argentina's fiscal problems and the monetary instability that they helped to create.

One view was that the currency board, by imposing hard budget constraints and eliminating the possibility of the inflation tax might serve to enhance fiscal discipline. The fiscal reforms and in particular the privatisation of large loss-making public enterprises certainly went in that direction. However, an opposing view is that the currency board

[30]My own view is that the market which predicted a significant default probability but clearly much less than unity around January 2001 was about right (750 basis point spread), but that default and possibly devaluation became virtual certainties after the bank run in August 2001.

made access to international debt markets easier and hence, 'relaxed the financing constraint' allowing for larger fiscal deficits.[31]

Most notably in the fourth quarter of 1994, Argentina missed a fiscal target with the IMF and an announcement was made that the IMF program would lapse just days before the devaluation of the Mexican peso that heralded the start of the Tequila crisis.[32] Arguably, a further statement in February 1995, that Argentina would not return to negotiate a new program with the IMF, sparked the systemic bank run in the first two weeks of March 1995, that then led to a new IMF agreement and, finally, a set of promised fiscal and other reforms.[33]

After the Tequila period, Argentina grew strongly and yet fiscal deficits remained and debt levels grew faster than the fiscal deficit. We graph the fiscal deficit and the change in the total public sector debt level in Figure 5. As can be seen total public sector consolidated debt levels grew much faster than deficits due to a set of non-budgetary items including the recognition of old debts (or non-budgeted payments with bonds), the costs implied by (non-provisioned) court cases against the state including pensions and compensation payments to families of those disappeared in the 'dirty war' and, significantly,

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[31] This view presupposes some creditor irrationality or a view, for example, that in the 'good times', market discipline is very weak perhaps due to competing lenders harking back to models of the 1980's debt crisis (see Kletzer 1984). See Aizenmann and Powell (2000) for a model where a divided government with a weak centre may borrow as much as it can from external markets due to an internal type of 'prisoners dilemma'.

[32] While the economy slowed notably in the second half of 1994, the fiscal target for the year was missed despite a growth rate of almost 5.8%.

[33] See D'Amato, Grubisc and Powell (19xx) for a description of the Tequila shock and its effects on the banking system. Ganapolski and Schmuckler (19xx) conduct an "event study" to attempt to identify the causes of the 'bank run'.

by the growing deficits of the Provinces. Over the period graphed, the accumulated difference between the change in debt and the accumulated fiscal deficit is some $30bn, a very substantial figure – an increasing amount of this difference stemming from provincial deficits in the last years.

Teijeiro makes perhaps the strongest case for fiscal irresponsibility as the underlying cause of the current crisis.[34] He estimates that in the 10 years, 1991-2000, the actual overall accumulated fiscal deficit, corresponding to the increase in debt, was $108bn (and not the officially budgeted $33bn) with $31bn of the difference being made up in terms of, "payments with bonds" and $16bn Provincial debts. This he calculates as 4.1% of GDP on average but reaching 6.6% in 1999 and 5.4% in 2000. However Teijeiro – in similar vein to Mussa – essentially calculates all 'transient' receipts as temporary (e.g.: revenues from privatisations) and all 'transient' costs as permanent (e.g.: pension system reform- see Hausmann and Velasco 2002 for an interesting discussion of the fiscal implications of the pension fund reform).[35] According to Teijiero, spending increased from 23% of GDP in 1992 to a record 29% in 1999. The analysis of the increase in spending suggests that that up until 1994 the major increase was current primary spending whereas after 1994 primary spending only increased marginally but interest payments increased substantially – up from almost $6bn in 1995 to $11.5bn in 2000.

By the end of 2000, Argentine public sector debt had reached 46.5% of GDP. While that level may not be high by continental European standards, some suggested that it was too high for a country of Argentina's characteristics. Mussa (2002) cites 5 reasons why a

[34] Teijeiro (2001).

[35] Teijeiro (2001) – in similar vein to Mussa (2002).

debt level of over 40% of GDP might be sustainable for an industrialised economy but not for a country of Argentina's characteristics.[36] These include (1) the poor performance in collecting taxes (total tax and social security revenues) have been only about 20% of GDP, (2) Argentine debt is mostly foreign currency and foreign held (we come back to this with respect to current account sustainability), (3) the dynamics of the debt ratio (which had risen from 19% in 1993 to over 40% in 1998), (4) vulnerability to external real shocks (e.g.: the Brazilian devaluation) and (5) vulnerability to financial market sentiment.

These last two reasons suggest an interaction between the competing hypotheses considered in this section. In other words, given the external environment in terms of the stability of neighbours and other issuers in external debt markets, and the threat of 'contagion' a safe debt level for an emerging country may be much lower than that for, say, a European country with a more stable set of trading partners and more liquid and stable debt markets.

Around the end of 2000, the opinion from the markets was clearly divided. Notably, JP Morgan suggested, that Argentina's "debt problem" was 'Much ado about not very much'.[37] The JP Morgan study consisted of modelling the Argentina debt profile and then thinking through different scenarios for interest rates, growth and the primary fiscal surplus. The analysis suggested that if growth remained constant, (real growth of 1.8% and nominal at 0.68%), then Argentina would have to increase the primary fiscal surplus to 1.8% of GDP (from 1.2% of GDP, i.e.: an increase of just 1.2% of GDP) to keep the debt to GDP

[36] Mussa (2002).

[37] On the other hand, Lehmann Brothers' saw the situation as unsustainable suggesting that Argentina should default, devalue or both.

ratio constant. This was calculated as the equivalent of US$4.5bn of spending cuts (or 4.8% of total consolidated public sector spending). It was suggested that this did not then imply a too high level of adjustment to be necessary to obtain a stable debt to GDP ratio.[38]

The JP Morgan analysis is based on an analysis of debt dynamics and we employ a similar analysis here to shed light further on this hypothesis. It is easy to show that that next period's debt to GDP ratio is related to this period's debt to GDP ratio via the following formula[39]:

$$d_{t+1} = \frac{1}{1+g_t}\left(f_t + d_t(1+r_t)\right)$$

Where d is the debt to GDP ratio, f is the primary fiscal deficit (if f is negative it would be a surplus), r is the interest rate on debt and g is the growth rate. The subscripts refer to the time period. Hence the debt to GDP ratio becomes larger (1) the higher is the current debt level, (2) the higher the primary fiscal deficit (3) the higher the interest rate and (4) the lower is the growth rate. Using this formula we can calculate the fiscal surplus that yields a stable debt to GDP ratio (d(t+1) = d(t)). This turns out to be:

$$s_t = d_t(r_t - g_t)$$

Where s is now the fiscal surplus (s=-f). We use this simple formula to calculate the level of fiscal surplus required to yield a stable debt to GDP ratio for each quarter through 2000 and 2001 and plot the results in Figure 6. The debt ratio is the level of debt divided by de-seasonalized GDP corresponding to that quarter and the growth rate is that quarter's de-seasonalized growth rate. We use two different assumptions regarding the interest rate. The

[38] For example, Brazil at the time had a primary fiscal surplus of about 3.3%, Ecuador 6.6% and Russia 5.9% of GDP.

[39] This assumes that there is no other source of financing to the Government e.g.:, through money creation.

first, (Interest Rate 1) is that quarter's actual interest payments divided by the previous quarter's debt level and the second (Interest Rate 2) starts at the same level (roughly 8.5% annualised) but then assumes that the annualised rate of interest rises 2% each quarter. We also plot the actual primary surplus attained in each quarter.

(Figure 6: Required Primary Fiscal Surplus)

The Figure shows that through 2000 and indeed, arguably, the first half of 2001 the required 'adjustment' in terms of increasing the primary fiscal surplus did not appear very large. Indeed in the second quarter of 2000 it is about 0.5% of GDP over the quarter (or less than 2% on an annualized basis and very close to JP Morgan's calculation). Taking 2000 as a whole it is about 3% of GDP on an annualized basis. Moreover, even under the stiff assumption that interest rates were rising by 2% (annualised) each quarter, the required primary fiscal surplus was still under about 4% of GDP on an annualized basis in IIIQ, 2000.

The graph also illustrates that, ex post, Argentina only achieved an extremely modest primary fiscal surplus at that time and in the IVQ, 2000, or IQ 2001, no primary fiscal surplus at all. While the gap between the actual primary fiscal surplus and the required primary fiscal surplus then increased in IQ/01 it narrowed again in the II/Q 2001 as the actual primary fiscal surplus rose (in part due to the financial transaction taxes). However, in the IIIQ of 2001, perhaps as a result of sharp increases in country risk as a response to the more heterodox economic program and its effects on the real economy, the more negative GDP growth started to imply implausible levels of required primary surpluses for stable debt levels.

While this analysis can of course be criticised for some of the underlying assumptions, the message is very clear. The required fiscal adjustment to achieve stable

debt to GDP ratios was modest. Surprisingly these modest levels of required adjustment continued until, arguably, the second quarter of 2001. The Argentine story does not appear to be one of sharp fiscal adjustment that was not enough but rather the lack of a (relatively modest) fiscal adjustment at the right time. Given the undoubted inefficiencies in Argentine public spending, and the inefficiency of tax collection, it is quite extraordinary that this relatively modest level of adjustment was not achieved.

There are at least two competing explanations.[40] The first is that it was simply not feasible politically. The evidence in favour of this hypothesis was the lack of support for the Lopez Murphy plan to cut expenditures and his forced resignation. The second is that Argentina could not, in the sense that if it did attempt to 'adjust' by reducing expenditures or increasing taxes, then the effect on the real economy was such that fiscal revenues would fall and hence the increased primary balance would never actually materialise. There is some evidence in favour of this hypothesis given the 'impuestazo' of Machinea and its effects on the real economy.[41]

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[40] Commenting on this paper Pedro Pou suggested a third, namely the inability to roll-over the debt. The spirit of the analysis here is one of solvency and hence if the result is that Government was solvent then there should be no problem with respect to rolling-over. However, it is certainly the case that the required primary fiscal surplus increases with more pessimistic assumptions about the percentage of the stock of debt that can be rolled over. While the debt maturity structure in Argentina was relatively long, such that the roll-over problem was less than it might have been, the analysis presented is conducted under the maintained hypothesis that roll over debt coming due was feasible.

[41] However, increasing taxes is not the same as reducing (inefficient) expenditures and arguably the 'impuestazo' was also inappropriate in its structure and hence led to more serious negative effects on the economy than might have been necessary. However, Teijerio (2001) argues strongly in favour of the hypothesis that during 1991-1998 higher spending financed by higher external debt was highly expansionary

Both of these hypotheses suggest that the problem, fundamentally, was not the level of debt but rather a problem of politics or a problem of vicious cycles/multiple equilibria. It would be correct to conclude, however, that given that the existence of these vicious cycles/multiple equilibria, or political constraints to adjustment, the safe level of debt to GDP for a country with Argentina's characteristics was, very clearly ex post, less than 45% of GDP.

B. Current Account Sustainability

A second hypothesis is that the Argentine crisis was really a result of an external constraint or in other words an unsustainable current account. There are different aspects to this explanation. One view is that as reviewed above, Argentina was hit by a set of fierce external shocks and that, due to the fixed exchange rate and inflexible domestic, labour markets, Argentina found it difficult to adjust. Indeed the only adjustment possible was through a slow and painful process of recession and deflation. Only through recession could imports be reduced and only through deflation would domestic prices adjust to start to make exports more competitive. According to this view Argentina would only grow once this adjustment process had been completed. At the same time, recession and deflation made the fiscal position much worse. Recession reduced tax revenues and deflation increased public sector wages and other fixed nominal expenditures in real terms.

However, exports grew each year through Convertibilitly – with the exception of 1999, after the Brazilean devaluation (see Figure 2). It is also quite extraordinary to note

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and that post 1998 tax rises and higher domestic debt helped to provoke the recession that led to an unsustainable debt position.

that Argentine agricultural exports and particularly grains increased substantially over the years despite high taxes in Argentina and lower world prices in part sparked by large subsidies to European and US producers. Still, these are only partial replies as it may still be the case that given the terms of trade and other shocks, exports perhaps had to increase by much greater rates in order to avoid the recession and deflationary adjustment and maintain programmed foreign debt payments. Indeed as can be seen in Figure 2, in each period of strong growth, the trade deficit widened substantially as imports grew much stronger that exports. While during the 1995 recession, the trade balance turned around quite rapidly, helped by a booming (and not very competitive) Brazil, this did not happen with any where near the same speed, through 1999-2001 with Argentina in recession and Brazil with low growth and a very competitive exchange rate.

Another, and complementary view, is that for whatever reason, the high levels of capital inflows that Argentina enjoyed through the first half of the 1990's stopped. Given a "sudden stop" in capital flows, Argentina had to adjust to achieve current account balance. This adjustment necessitated increased exports and reduced imports. Argentina, again due to the fixed exchange rate and internal inflexibility, was only able to achieve a modest increase in exports, and hence had to decrease through imports once again recession, provoking an unsustainable debt position.

However, this is at best only a partial explanation, as it does not explain why there was such a 'sudden stop' in private capital – we come back to that below. If the stop in private capital was due to the perceived risk of the Argentine public sector, due to its high debts, then we are back to the unsustainable debt story. If, however, the explanation of the 'sudden stop' is due to a change in 'risk aversion' of foreign investors perhaps due to experiences in Russia then that is more a story of an external shock.

To analyse the sustainability of the current account a little further it is also necessary to discuss the structure of Argentine debt. First, we consider the Argentine public sector debt structure. Powell proposes three different definitions of external debt appropriate for three different purposes.[42] A currency definition is appropriate for analysing what would happen, in the case of devaluation - assuming no "pesification"! A definition depending on where the debt is issued would be appropriate for analysing what would happen in the case of default and hence how much debt is written under the standard contracts and treatment of different legal jurisdictions. However, to analyse the sustainability of the current account, the correct definition – consistent with all current account definitions would appear to be residence. In the Table 1 we present an estimation of the structure of Argentine public sector debt at the end of 2000 according to these different definitions. While some US$118bn of Argentine consolidated public debt was in foreign currency, some $97bn of total debt was issued outside of the country and an estimated US$85bn held by non-residents.

(Table 1: Structure of Argentine Public Sector Debt)

While $85bn is not $97bn or $118bn, it is still a very significant figure and almost four times exports! Moreover this is only external public sector debt. To complete the picture, we must also add to this private sector external debt that, at the end of 2000, amounted to some $62bn according to the same residency basis.

The substantial and persistent current account deficit in Argentina reflected, in part, the interest payments on these high external debt figures. In Figure 7 below we graph the trade balance and the current account balance. The persistent and growing difference

[42] Powell (2002).

between the two, in part, reflects the sale of domestic companies to foreign ones, and hence growing retained earnings of those companies (an outflow in the current account and an inflow in the capital account), but also the growth in interest payments on foreign debt. However, while both private and public sector debt grew through Convertibility, it is noticeable that the Argentine private sector built up substantial reserves of external assets. In some years it is very clear that the substantial capital inflows, through debt and through FDI, also led to high residents' outflows.

(Figure 7: Trade Balance and Current Account Deficit)

In Table 2 below, we give figures on Argentine private and public sector external debts and external assets as of end 1994 and end 2000. The bottom line is while private sector external debts grew over this period by $37bn, private sector external assets grew by US$44bn. At the same time external public sector debt grew by $24bn but external public sector assets (essentially Central Bank reserves) grew by only $9bn.

(Table 2 here)

Thus while the growth in interest payments that Argentine private sector companies paid on their foreign debt had a counterpart in the earnings on increased foreign assets (albeit perhaps the owners being the household rather than the corporate sector), there was no similar counterpart (or at least a much smaller one), to the growth in interest payments on increased public sector external debt.

However, these somewhat alarming ratios and trends constitute only partial analyses of 'current account sustainability'. Indeed a more complete analysis can be conducted regarding the sustainability of the current account in very similar vein to the analysis above on fiscal sustainability. In particular to maintain a constant external debt to GDP ratio requires a trade surplus (as a percentage of GDP) given by the following equation:

$$ts_t = d_t(r_t - g_t) - o_t$$

Where we assume that reserves remain constant and d is the external debt to GDP ratio, r is the interest rate on external debt, g is the GDP growth rate and o is the ratio of other (net) inflows as a percentage of GDP. The t subscripts refer to the time period. Other net capital inflows might include stable or persistent net flows such as FDI and earnings on overseas assets.

In Figure 8 we plot the estimated required trade surplus at each point in time (required to keep the external debt level and reserves constant), versus the actual trade surplus for different assumptions regarding other flows – 'o'. Other net inflows include (1) the net service balance (2) the net flow of dividends (3) interest earned on foreign assets by Argentine residents and (4) the inflows in the capital account net of the change in the external debt of Argentine residents - including for example FDI. The first assumption is that 'o' is the actual figure for 'other flows' for each quarter. This line then really gives the trade surplus required such that the external debt ratio does not increase and the reserve level remains constant. We include in the graph the actual change in reserves as information. The second assumption is that 'o' is fixed as the average for the period, 1998-2001, which is a net inflow of 0.5% per quarter (about 2% per annum). Finally, we include the actual trade balance for comparison.

(Figure 8: Required Trade Balance for Current Account Sustainability)

Assuming then that actual other net inflows remain roughly at these historical levels, the main message from the graph is that the actual trade balance through 1999 was a little below the required level but that by 2000, it was roughly at the required level for external debt sustainability. The situation then blows up later in 2001. The striking aspect

of this graph though is that it appears to suggest that the required adjustment in the trade balance was more or less complete through 2000. Certainly what happened in 2001 does not seem as if it could be a consequence of a deterioration of this measure through 2000.

A potential criticism of this analysis, however, is that other net inflows may not remain at these levels. For example, Argentina received a substantial amount of FDI in the period 1998-2000 and it might be posited that this would not continue. However, this argument forgets that Argentine residents placed much of the proceeds of these inflows abroad – as evidenced in Table 2. Moreover, the average other net inflows (the second line in the graph) is averaged including 2001, a very negative year indeed for the private capital account. It might however be suggested that the Argentine resources abroad might not be repatriated if things got tough. This is certainly true but it is not an explanation of why things got tough. Moreover, if the theory is that capital inflows were going to stop, and hence the current account would become unsustainable, then we really need to explain why capital inflows were going to stop. This is not an explanation regarding the sustainability of the current account, but rather about the nature of capital flows or a story of multiple equilibria. The conclusion is that a simple story of a lack of current account sustainability does not fit the facts of the case.

C. Political Risk

The above descriptive account of the Argentine crisis also suggests that Argentine politics became particularly messy from 1998 onwards. On the one hand, politics became more factious and, through 2000 and 2001 there were very severe concerns regarding 'governability'. An alternative view is then that there was a substantial shift in Argentine political risk that affected the perceived risk of investment and hence growth. In this view,

while the debt position may have been perfectly sustainable with more stable politics, the increased fractious nature of the political environment implied that the inherited debt level became unsustainable.

One approach would be to subjectively select a set of 'political events' during the period.[43] However, in an attempt to obtain an independent and impartial view of the deteriorating nature of Argentine politics, we plot in Figure 9, an index of political risk developed by the International Country Risk Guide.[44] This indicator of political risk is designed to be consistent across time with a set of standard questions. The types of factors included are Government stability, public satisfaction with the government program, the government's attitude to inward investment, internal conflict (e.g.: political violence) and external conflict (trade restrictions and embargoes), corruption, the role of the military in government, religious tension, law and order, ethnic tension, democratic accountability and bureaucratic quality. In fact this Figure shows that Argentine political risk was not considered particularly high through much of 1997-1999. There is a sharp dip in October 1999, coinciding with the election result and presumably concerns about 'governability' however the index recovers. Through 2000 there is a downward, if volatile, trade but once again the index recovers in the early part of 2001. A very sharp decline however begins in July/August 2001.

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[43] Candidate events might include (1) Duhalde's address to the Argentine Banking Association in July 1999 (2) The October 1999 election result (3) The resignation of the Vice President in October 2000 (4) The resignation of Jose Luis Machinea and the coming and going of Ricardo Lopez-Murphy as Economy Minister in March 2001 (5) The resignation of Cavallo as Economy Minister in December 2001.

[44] See International Country Risk Guide (1999) available on www.prsgroup.com

(Figure 9 here: Argentine Political Risk)

While particular events or perceptions of political risk may have affected country risk, economic activity or other variables it is interesting to consider whether these events were simply random occurrences or whether there is a deeper and more fundamental reason why Argentine politics became so 'messy'. Political scientists have for example noted that the interaction of the decentralised structure of the national parties, the Federal nature of the parties and the over-representation of under populated areas of the country have led to divisions both within the Parties and between the Federal Government and the Governments of the Provinces.[45] There has also been substantial criticism of the particular form of Argentina's version of proportional representation and party electoral lists.[46] In turn, one hypothesis is that these factors have led to problems of excessive divisions within parties and across regions, to a high political cost of Government, to a low level of 'accountability' and low levels of efficiency of public spending.[47]

D. Multiple equilibria

The above three hypotheses are not by any means mutually exclusive and indeed to a large extent they are complementary or reinforcing. Indeed, the final hypothesis that we discuss here is that the crisis was the result of a particular dynamic between the three hypotheses above and that Argentina, through bad luck or through some relatively minor

[45] See Calvo (2000) et al.

[46] See Tommasi et al.

[47] While we do not discount this more fundamental view of the political risk we note that it is difficult to identify whether it is correct or not with the data and methodology adopted in this paper.

'mistake' then found itself in a very bad equilibrium - from which it could not then escape without default and devaluation.

As noted in the above description of events, a double vicious cycle appeared to develop. A purely economic cycle ran from poor economic performance to lower fiscal revenues to a higher fiscal deficit to higher risk spreads, higher interest rates and back to lower economic performance. This implies that Argentina fell into a kind of economic trap from which it could not escape. It implies, in particular that higher risk spreads were both a cause of the problem, in terms of reduced growth, but also an effect in that higher fiscal deficits increased risk spreads.

A second included politics. In particular, poor economic performance and higher fiscal deficits led to the increased need for adjustment, greater political squabbling, a high risk spread and hence poorer economic performance. Under this view, political risk was not just a cause of the economic crisis but that also poor economic performance fed back to create heightened political risk.

These types of vicious cycles imply that there may have been multiple equilibria. In other words, while a particularly poor outcome was observed, in fact other outcomes were also feasible but not found. Unfortunately, the 'science' of economics has not to date developed a good theory why under conditions of multiple equilibria, one equilbrium was chosen and not another.[48]

The issue as to whether there are multiple equilibria or not is an important one in relation to the role of the IMF. If there are no multiple equilibria then the IMF's role might

[48] See Miller and Z for an interesting theoretical model of the Argentine crisis with potential multiple equilibria.

be thought a great deal simpler as everything would flow reasonably easily from a simple analysis of countries' fundamentals. However, if there are multiple equilbria it is quite possible that, say, a major IMF support package could shift a country from a bad equilibrium to a better one. If that is the case, then what might be considered a hopeless situation in terms of say low growth, high interest rates and capital flight might potentially be turned around to a virtuous one of capital repatriation, lower interest rates and higher growth.

3. An Empirical Evaluation

In this section we conduct an empirical analysis in the period leading up to the Argentine crisis (1997-2001), to attempt to discern which, if any, of the above hypotheses may have empirical support. It is clear from the descriptive analysis that in attempting such a study there is an almost pathological problem of endogeneity and indeed this endogeneity is the key to one of the hypotheses; namely the existence of multiple equilibria. It would be beyond the scope of this paper to develop a full structural model of the Argentine economy. For these reasons, our approach is to select a small number of key variables and investigate the temporal relations between those variables using a Vector Auto-regression Analysis (VAR). This technique uses the bare minimum of structural assumptions (we come back to these below) and allows us to consider the full set of 'causal' relations between these variables.[49]

[49] The concept of 'causality' within a VAR is similar to that of 'Granger causality' or in other words whether the past of one variable is significant in explaining the future of another, and/or vice-versa.

The variables chosen for this analysis are (i) the indicator of political risk (ii) fiscal revenue (de-seasonalized) (iv) imports (de-seasonalized) and (v) the EMBI+ spread (we use monthly averages). Integration tests reveal that all variables are I(1) and so we chose to work with first differences to avoid problems of non-stationarity.[50] Positive shocks to imports may be considered in two different ways. They might represent good news on economic activity or bad news on the trade balance and hence the sustainability of the current account. Positive shocks to deposits may be thought of as good news regarding the capital account and also to the potential to finance government debt. We interpret positive shocks to fiscal revenues as good news regarding the sustainability of the debt position and we use the political risk indicator as an objective proxy for political developments in Argentina. This selection of variables, allows us to shed light on the hypotheses regarding the roots of the crisis. For example:

1) If there is evidence that lower fiscal revenues drive the EMBI spread higher, then this would be evidence in favor of the debt-sustainability hypothesis.
2) If higher imports drive the EMBI spread higher then this would be evidence for the current account sustainability hypothesis. If on the other hand higher imports drive EMBI lower then this would mean the good news on economic activity outweighed the bad news on the current account sustainability.[51]

[50] For the series of log deposits I(0) was rejected at the 5% level whereas for the other series it was rejected at the 10% level. There was potential evidence of one co-integrating vector between these variables. We leave the possibility of a Vector Error Correction Model for future research.

[51] We note that as fiscal revenues are included in all equations higher imports would carry news regarding economic activity that was not directly related to fiscal revenues.

3) If political risk drives the EMBI spread higher then this would be evidence for the hypothesis that political risk was also important in the story.
4) If lower bank deposits are found to be significant for EMBI then this might be interpreted as evidence in favor of both, the current account sustainability hypothesis, or, fiscal sustainability. It would also be evidence for the importance of the 'sudden stop' in capital flows.

The VAR approach and our choice of variables also allows us to 'test' slightly more complex hypotheses:

5) If 1,2, 3 or 4 are supported by the data, and we also find that the EMBI spread feeds back to fiscal revenues, imports, or political risk then there would be evidence of a feedback relation within the economic variables that would support the idea of multiple equilibria.
6) If the other variables were significant in explaining Political Risk and deteriorating Political Risk led to lower fiscal revenues, lower imports or higher EMBI then there would be evidence of a feedback and potential multiple equilibria through the politics.

Our approach was to specify an unrestricted VAR with a large number of lags and then cut down the lag length according to the Akaike information criterion. The Akaike information criteria allowed us to cut the system down to just one lag. The results of the VAR analysis are presented in Appendix 1.

The VAR regression results indicate a number of significant interactions including for example that (1) changes in bank deposits and imports help to explain changes in the Embi index (2) changes in imports and changes in political risk help explain changes in

deposits (3) changes in deposits, imports and political risk help explain changes in fiscal revenues (4) changes in bank deposits and fiscal revenues help explain changes in imports and (5) changes in fiscal revenues and imports help to explain changes in political risk.

However the coefficients in the empirical model of a VAR are less interesting than the analysis of the so-called structural model which takes into account the relevant interactions between variables when considering the effect of a shock to one variable on another. This latter information is summarized in the 'impulse response functions'. However, to move from the empirical model to the structural model requires some assumptions regarding the relations between these variables. Here we employ the so-called Choleski decomposition, which implies a particular ordering of the variables in terms of their contemporaneous relations.

We have 5 endogenous variables and we posit the following ordering: EMBI, Deposits, Fiscal Revenues, Imports and Political Risk. We posit this ordering as the EMBI index for a particular month is available immediately whereas the other variables only become available with a lag. This lag is at a minimum for bank deposits (4 days), followed by tax revenues, followed by imports, followed by political risk. This implies that we restrict the contemporaneous relations such that EMBI can affect all 4 other variables, deposits can affect 3 other variables (not EMBI), fiscal revenues can affect 2 other variables (not EMBI, or deposits), imports can affect one other variable (political risk) and political risk cannot affect any other variable contemporaneously. It is important to note however that after one period, and for all other periods thereafter, there are no constraints

i.e.: all variables can affect all others. These restrictions are only on contemporaneous effects.[52]

In our preferred ordering the impulse responses (see appendix) show a number of interesting interactions. In particular, there is evidence that (1) Higher EMBI leads to lower deposits and lower fiscal revenues, (2) Higher deposits lead to lower EMBI, higher fiscal revenues and higher imports (3) Higher fiscal revenues lead to higher imports initially although after one period the effect turns negative (4) Higher imports lead to lower EMBI, higher deposits, higher fiscal revenues, and a higher political risk index (lower political risk) and (5) A higher Political Risk index (lower political risk), leads to higher deposits and higher fiscal revenue.

One interesting result is that EMBI spreads rise if imports fall. This appears to go against the current account sustainability hypothesis and in favor of the debt sustainability hypothesis suggesting that rising imports as a sign of more growth outweighs any negative effects on current account sustainability. EMBI also rises if deposits fall and as noted this can be interpreted in favor of the debt sustainability (less financing) or current account sustainability (sudden stop) hypotheses. Political risk does not feed directly into EMBI (perhaps EMBI already incorporates the information in this index), although it does feed through to economic fundamentals.

There is strong evidence of vicious/virtuous cycles operating through the economic variables. In particular, (1) lower deposits lead to higher EMBI and higher EMBI feeds back to lower deposits, (2) lower deposits lead to lower imports that leads to higher EMBI that leads to lower deposits, (3) lower deposits lead to lower fiscal revenues that lead to

[52] Moreover, in what follows we change this ordering to test the robustness of our results.

(initially) lower imports that leads to lower deposits. There is also evidence of a feedback through the political risk index. In particular a higher political risk (lower index) drives lower deposits that drives lower imports, which feed back to higher political risk. We summarize the many different interactions between the variables in Figure 10 below.

(Figure 10 here)

The appendix also contains the variance decompositions from the VAR. These are also of significant interest. In particular we note that while there is evidence of feedback through the politics, only 13% or so of the variation in the Political Risk index is explained through the other variables with some 87% then exogenous to this system[53]. This implies that exogenous (i.e.: new) shocks to Political Risk were extremely important in explaining the variation of this variable over time. On the other hand 46% of the variation in imports is explained by the other variables (in particular EMBI (3%), deposits (20%) and fiscal revenues (23%)) and 33% of the variation in fiscal revenues is explained by the other variables (especially EMBI (9%), deposits (10%), imports (8%) and Political Risk (6%)). This suggests that, while exogenous events were also important, a significant amount of the variation in these variables is explained within the system. On the other hand only 25% of the movement in deposits is explained by the other variables (especially Political Risk) and 75% of the variation in this variable explained by exogenous events. We also note that only some 13% of the variation in EMBI is explained by the variables within the VAR.[54]

As is often the case, changing the order of the variables produces some differences in the impulse response functions. Here we reverse the above order such that we have the

[53] And the ordering adopted implies that this variable is the, 'most endogenous'.

[54] This figure rises substantially however on changing the variable ordering within the VAR.

following ordering; political risk, imports, fiscal revenues, deposits and EMBI. EMBI is now the most 'endogenous' variable rather than the most exogenous and we find that the effect of EMBI on some of the other variables remain but become less significant (e.g.: EMBI on deposits). We therefore lose the significance of some of the feedback relations within the economic variables. Higher EMBI spreads are still however driven by lower deposits (sudden stop), lower fiscal revenues (debt sustainability) and lower imports (less growth and hence less debt sustainability) although this latter effect is once again, under this ordering not significant. Under a third ordering (fiscal revenues, imports, EMBI, political risk and deposits), the economic feedback effects become positive once again especially between EMBI and deposits. The broad message is that the direction of the effects is reasonably constant across these different orderings while the significance levels do change.

The general conclusion from this analysis is then (1) there is some evidence to support the debt sustainability hypothesis, (2) there is little evidence to support the current account sustainability hypothesis (i.e.: higher imports resulted in lower country risk), (3) bank deposits (sudden stop) was a critical variable and might be interpreted as in favor of either the current account or debt sustainability hypotheses but coupled with the other evidence the interpretation offered here is that this variable was important with respect to fiscal sustainability and potential Government financing and (4) there is evidence to suggest that political risk affected economic variables that then certainly made the debt position worse and (5) there is strong evidence in favor of vicious cycles at work and hence multiple equilibria through solely economic variables and also from the economic variables to the politics and back to the economics.

4. The Role of the IMF

(i). To support or not to support

Argentina is a major emerging economy that at the end of 2000 had GDP of some $US290bn, the third largest in Latin America, had a disproportionate share of international debt markets and is an important member of the IMF. Moreover, in many respects Argentina went from being the 'role model' to 'financial pariah' in the matter of only some 3 years.[55] As when a previously successful major bank collapses, the regulator is always asked what was to blame and why the collapse was not prevented, it is also natural to consider what the role of the IMF (as the main international agency concerned with countries' macroeconomic prospects and international financial market stability), was with respect to the Argentine crisis.[56]

There has been much general criticism of "IMF type programs" that tend to focus on public sector austerity and exchange rate devaluations. In the case of Argentina, the IMF actually supported the exchange rate policy consistently, through Tequila and at least tacitly through the late 1990's through to the first quarter of 2001 - objecting to the Cavallo idea of introducing the Euro. The austerity programs, to the extent that they were implemented, were designed very clearly by Argentina. There is no doubt that the Argentine crisis was a

[55] Indeed President Menem was given the rare honour of addressing the IMF assembly in 1997.

[56] Bank regulators normally state that their role is not to prevent a bank from failing and indeed that the possibility of bank failure is healthy in terms of promoting bank competition. It is not clear that this analogy can be pushed to the case of countries. While the possibility of failure may reduce 'moral hazard', countries do not compete in the same way as banks and citizens do not have the automatic right to change countries as bank depositors may switch to better banks.

product of policies produced in Buenos Aires, and for reasons explained below that the solution will most likely have to be solely one produced from Buenos Aires as well.

Mussa argues persuasively that the IMF was right to (eventually) support the currency board in Argentina post 1991, and to maintain that support through the Tequila crisis of 1995.[57] He goes on to criticise the IMF for not being tough enough on Argentina during the 'good times' of 1996-1998 but suggests that the major support package extended to Argentina at the end of 2000 was appropriate. However, he returns to criticism with respect to the August 2001 package, characterising it as one of the worst decisions that the IMF has ever made!

In section 2, the broad conclusions were that, (1) the fiscal adjustment that Argentina needed to make was not particularly large even by the end of the first quarter 2001 and (2) that the trade balance had adjusted through 2000 such that current account sustainability was not a critical issue. However, the conclusion of the previous section was that political risk was a significant factor and that the Argentine economy had fallen into a vicious cycle or bad equilibrium path. These conclusions broadly support the view that, depending on your reading of 'political risk', the IMF was right to maintain engagement and a program, at least through the first quarter of 2001.

However, with the lack of political support for the Lopez Murphy plan, an argument can be made that at that point the political boundaries for potential 'adjustment' had been drawn, and given the only political feasible alternative to close the fiscal deficit were new increases in taxes it was becoming more clear that Argentina would not make it out of the 'bad equilibrium'. As the more heterodox economic policies were introduced, the reaction

[57] Mussa (2002).

of the markets simply pushed Argentina further into the trough of that bad equilibrium with EMBI spreads of over 1000 basis points.

At that point, one view might be that the IMF had a decision to make. The IMF either, had to stand out and say that the markets were wrong and support Argentina very strongly indeed to attempt to break the vicious cycle, or it had to say that the situation had become unviable and that Argentina should seek a renegotiation of the debt and cut its losses. As it turned out, the IMF did neither. While the IMF signalled some displeasure at elements of the more heterodox strategy such as the entrance of the Euro into the currency basket and the introduction of the de facto dual exchange rate regime, while the probability of the IMF pulling out clearly increased, the program appeared to continue.[58] However, the perception was that the Fund was vacillating, unsure whether to continue the program or when to pull the plug.

The rumours especially after the introduction of the de facto dual exchange rate were that the Fund was about to withdraw and this created the environment for the bank run in late July/August. Finally the Fund came through with a package for $8bn, and although there was much talk that private sector involvement of some sort would be sought, in fact the package included roughly $5bn of new money to shore up central bank reserves plus $3bn for some unspecified debt restructuring enhancement. However, it was never very clear whether this was to be voluntary, in which case $3bn always looked dramatically insufficient, or forced and if so how exactly that would happen.

The August package clearly arrested the bank run but the sharp liquidity crunch had very negative effects on the economy. As the fiscal figures for September became known,

[58] Mussa (2002) cites a set of more institutional reasons as to why the program was most likely continued.

and it became obvious that Argentina would not make the annual fiscal target for the IMF, the preconditions for another run were in place. The announcement of the zero-deficit plan, and the subsequent increase in country risk (see section 1 above) and the decrees limiting interest rates on bank deposits were the final trigger. This bank run was not met with an IMF package and indeed the IMF declined to send any more funds, provoking the 'corralito' and subsequent downfall of the de la Rúa Government.

(ii). Understanding the strategic interactions

While one approach is to argue in favour or against particular decisions made by the IMF at particular times, it appears a more useful strategy to attempt to understand the nature of the strategic relationship between the IMF and the country that might then lead to the strong perception of an IMF vacillating between supporting and not supporting Argentina through 2001. Perhaps if we understand why this outcome occurred we may then attempt to design a set of institutions that would help to prevent such outcomes occurring in the future. In Appendix 2, we present a very simple 'game' along these lines where the IMF decides to Assist or Not and the country decides whether to play Safe or to play Risky. We label the four potential outcomes; First Best (IMF Assists and Country plays Safe), Moral hazard (IMF Assists and the Country plays Risky), Worst Case (IMF does not Assist and the country plays Risky) and On Your Own (IMF plays No Assist and Country Plays Safe).

An interesting feature of this game is than in its non-cooperative one-shot (static) form, there is no (Nash) equilibrium in so-called pure strategies. There is however a unique (Nash) equilibrium in 'mixed strategies' where the players 'randomize' between their possible actions. What this means in practice is that, in equilibrium, the IMF can never

unequivocally Assist and the country can never unequivocally claim that it will play Safe. In its most literal interpretation the players randomise. One way to think about this is a rationalization of the 'case by case' or 'constructive ambiguity' doctrine.

However, assuming the game is repeated, there is a possibility of cooperation developing such that the First Best is attainable (where the IMF Assists and the country plays Safe). This is feasible because the incentive for the country to deviate to the Risky strategy (to get the Moral Hazard outcome) is contained by the threat that then the IMF will respond with the mixed strategy equilibrium for ever which, in the long run, may be worse for the country. It turns out that if the country has a high enough discount factor, or in other words, if the country derives sufficient benefit from future payoffs relative to the payoff today, this cooperative First Best outcome may be supported. However, it also follows that if something changes (e.g.: the payoffs) then the country may well deviate and the IMF will respond with the mixed strategy.

(iii) Relating the 'game' to Argentina

The interpretation offered here is that Argentina and the IMF had indeed achieved the cooperative First Best outcome at some point during the latter half of the 1990's with Argentina following a reform policy and the IMF Assisting with a program. Admittedly this position is debatable although it seems consistent with the decision of the IMF to continue to support Argentina up to and especially with the major 'blindaje' programme at the end of 2000, and is also consistent with the analysis above that the debt position and the current account were not too far away from 'sustainability'. However, for whatever reason during 2001, Argentina deviated to the Risky strategy. One view is that having obtained the 'blindaje', the moral hazard outcome and hence deviation became more attractive. The

evidence in favour of deviation is first and foremost the rejection of the Lopez Murphy plan, and then secondly, the swathe of heterodox measures that attempted to 'get the economy moving' while risking higher country risk spreads.[59] As it turned out this, 'gambling for resurrection' as it might be labelled, failed to turn the economy around and as predicted the IMF returned with a 'mixed strategy' vacillating between Assistance and non-Assistance.

(iv) Implications for institutions

It is interesting to consider what this story implies for the role of the IMF as a country gets closer and closer to default. It can be shown in a slightly more complex version of the model, (see Powell 2002) that the incentives to deviate rise as the probability of default in the case of Risky play rise. It is then likely that a country will have the incentive to deviate to the Risky strategy and 'gamble for resurrection' before actually defaulting. There is then a structural problem to the role of the IMF which given current institutions appears without solution. We may argue over the minutia of IMF decisions and whether the IMF should have withdrawn support earlier or later but the fact is that, for a country that enters default, the country will most likely have previously 'gambled' and the IMF will have vacillated.

One solution to this problem is to provide the country with an alternative. If the country is to decide for that alternative then it should, normally, be worse than the First

[59] Some might argue that Argentina had deviated before, perhaps even during Menem's second term. Others might suggest later, for example with the introduction of the de facto dual exchange rate or even later with the decrees limiting interest rates on banks. Adopting on of these alternatives would change the details of the story but not the underlying message regarding institutions that follows.

Best, but just at the point where the country has the incentive to deviate to the Risky strategy it should be superior to the First Best and it should be superior to the discounted payoff from deviation. One candidate solution is then a 'bankruptcy' procedure as advocated recently by Anne Krueger. The above approach appears to put some limits as to how attractive or painful such a process should be. If such a procedure had been available to Argentina through 2001, perhaps it would have provided for a better set of strategic interactions between the country and the IMF.[60]

Moreover, we have not discussed here explicitly the role of the private sector - although this is incorporated into the game explained in Appendix 2 in a very simple manner. Given the terrible coordination problem within the private sector and the lack of a solution to the problem as suggested above, in the case of Argentina, the private sector ran massively through 2001. Reserves fell by US$12.2bn and the private sector capital account registered a fall of some $12bn with errors an omissions (most likely reflecting further capital flight) another $3.5bn.[61] The Risky strategy adopted by Argentina through 2001, this massive loss of liquidity (plus the subsequent default and asymmetric pessification!), has now bankrupted what was a highly solvent and liquid banking sector and has now made the potential recovery process very difficult indeed. This process does not appear to be an efficient one to rectify a problem of public sector insolvency, current account unsustainability, increased political risk or multiple equilibria depending on the reader's

[60] A bankruptcy procedure may not be the only solution to this problem however it seems the most likely one that would genuinely provide an alternative for an incumbent government rather than the Risky strategy.

[61] We note that, consistent with the predictions of the model in the appendix, the recent uncertainty over further official assistance for Uruguay has also helped to spark a very significant run from the country's banking system and provoked a set of banking suspensions complicating the situation quite dramatically.

preferred hypothesis. If the analysis above is correct, and that Argentina's fiscal problems were not so dramatic and the current account was not so far away from sustainability, at least before Argentina 'deviated', and the problem was more one of heightened political risk and 'multiple equilibria' it appears an extremely inefficient crisis resolution procedure.

5. Conclusions

This paper has been largely one of history attempting to understand what happened. After a brief description of the events, four hypotheses were posed as potential roots of the current crisis. While Argentine public sector debt had increased sharply, the required adjustment to make the debt ratio stable did not appear so large, even as late as Q1, 2001. While the external debt had also risen sharply, an adjustment process in the trade balance appeared to have been more or less been completed again by the end of 2000, and the collapse of 2001 certainly did not seem to be a result of a wildly unsustainable current account. The preliminary conclusion from this analysis is then that political risk, playing together with the mild level of required adjustment in the fiscal accounts, put Argentina into a bad equilibrium, which it did not escape without eventual devaluation and default. There is also support for this explanation using a Vector Auto-Regression (VAR) analysis that showed a set of inter-relations between key economic variables. Political risk fed through to worsened economic fundamentals and these fed back to increased political risk. Low fiscal revenues and lower imports fed through to higher EMBI spreads which in turn fed back to lower imports and lower fiscal revenues.

The fact that fiscal sustainability and current account sustainability were not far from Argentina's grasp, justified the IMF's continued involvement through 2000 and into the first quarter of 2001. Perhaps if political events had been different and Argentina had

had some good luck, the 'blindaje' may even have turned things around, as more messy politics made things even worse. The lack of support for the Lopez Murphy plan appears to mark a watershed and marked the boundaries of the politically feasible adjustment in government spending under the de la Rúa Government. It is suggested above that, with the 'blindaje' in place, Argentina then adopted a more risky strategy attempting to get the economy moving with more heterodox measures and risking negative market sentiment and IMF disapproval.

At that point it might be argued that the IMF had to make a decision, assist Argentina strongly or withdraw. However, it did neither. A more formal game theoretic analysis, suggests that this deviation to risky play might have been a rational strategy for the country. Cooperation between the IMF and Argentina then broke down and in the formal analysis it was shown that the non-cooperative game between the IMF and the country has no 'pure-strategy' equilibrium. The only equilibrium is with the IMF vacillating between assisting or not. This was exactly the perception in Buenos Aires where the perceived probability of the IMF program continuing varied each day according to the new announcements.

Indeed, the August package came as something of a surprise for many, and clearly arrested the bank run in progress at the time. But the run had already done its damage to the real economy. Eventually, the IMF did indeed withdraw its support and a second, major bank run ensued. This provoked the 'corralito' and the 'cazerolazo' that, together with a set of more violent protests, eventually brought down the Government.

At the time of writing, Argentina has entered into a very deep crisis and there is still no clear solution in sight. Argentina has defaulted and still not entered into negotiations with external creditors, it has devalued with no clear vision with respect to future monetary

policy and through asymmetric ‘pesification’ and default, has broken its banks. The IMF and world leaders called for a ‘sustainable’ policy and President Duhalde’s repost was that there was little chance of a sustainable solution without an IMF agreement.

This interchange suggests that the game with no pure strategy equilibrium continues. The IMF will not Assist for fear of ‘moral hazard’, but if it does not Assist then the private sector will not have confidence to invest, even if the country plays Safe. The repeated game suggests that a cooperative First Best (where the IMF Assists and the country plays Safe) will only become available when the threat of the removal of IMF Assistance is meaningful. This implies IMF Assistance will be available only once the crisis has been resolved. The conclusion is then that a ‘sustainable’ policy must be found in Buenos Aires. Curiously, this argument suggests that the IMF, at least under its current ‘modus operandi’, may be largely irrelevant to a country in a crisis as deep as Argentina’s. The only thing the IMF can do is point to the benefits that there would be in a future, once the sustainable policy had been found and IMF assistance subsequently granted.

In terms of the current policy debate, The Government is caught between the banking sector controls (being eroded by the courts) and the monetary overhang caused by the lack of confidence in domestic institutions, and its effect on the exchange rate if released. This is not the place for a detailed analysis of potential solutions - that would deserve another paper - however it is clear that a resolution to the crisis in the financial system is a necessary condition for Argentina to grow.

The analysis also suggests a structural problem with respect to institutions. The ‘game’ analysed suggests that a country with an IMF program in place but heading towards default will at some point deviate to a risky strategy and ‘gamble for resurrection’. In turn the IMF will most likely find itself adopting a mixed strategy (i.e.: vacillating) in order to

attempt to control the ‘moral hazard’. As the IMF finally withdraws support, the country will face a liquidity crisis (as well and on top of whatever problem there is in fundamentals) that will make the recovery process much more complex. This is not an efficient crisis resolution process. There appears to be still much work to be done to construct a more efficient crisis resolution process. A bankruptcy procedure for sovereigns might be one candidate solution in order to provide country with an alternative to deviation. The analysis then suggests that this procedure should (normally) result in a payoff to the country worse than the First Best (where the IMF Assists), but slightly better than the Risky strategy at the point where the country otherwise has the incentive to deviate. This may then help to put some bounds on how attractive or painful such a procedure should be.

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Appendix 1

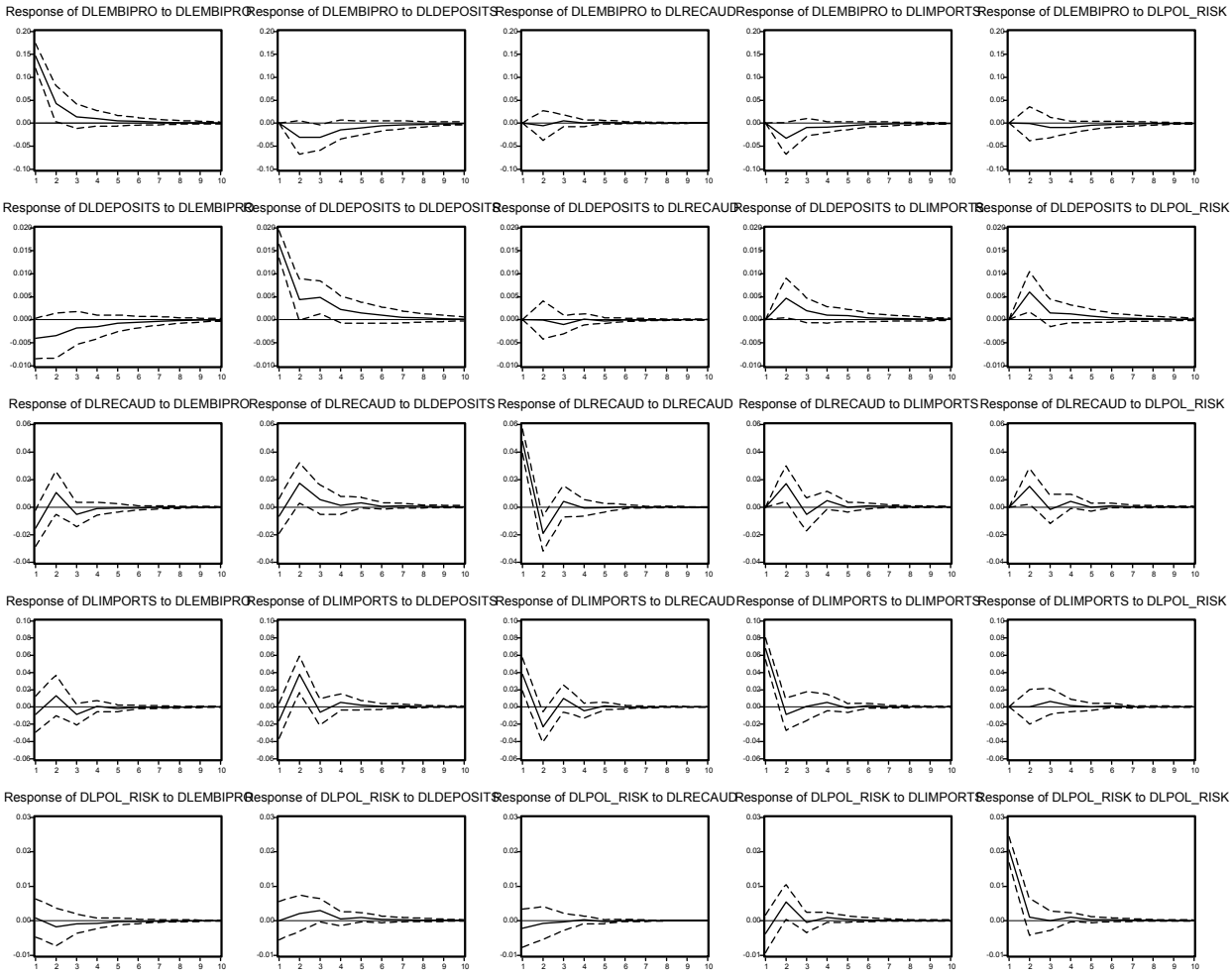
(i) Vector Auto-Regression Results

Date: 04/22/02 Time: 13:48
Sample(adjusted): 1997:03 2001:12
Included observations: 58 after adjusting endpoints
Standard errors & t-statistics in parentheses

	DLEMBIPRO	DLDEPOSITS	DLRECAUD	DLIMPORTS	DLPOL_RISK
DLEMBIPRO(-1)	0.226797	-0.017166	0.051301	0.098501	-0.011706
	(0.14111)	(0.01630)	(0.04877)	(0.07678)	(0.02032)
	(1.60719)	(-1.05311)	(1.05188)	(1.28286)	(-0.57617)
DLDEPOSITS(-1)	-2.273865	0.326157	1.103569	2.037212	0.178669
	(1.10698)	(0.12787)	(0.38259)	(0.60233)	(0.15937)
	(-2.05412)	(2.55070)	(2.88451)	(3.38225)	(1.12107)
DLRECAUD(-1)	0.276356	-0.056002	-0.603383	-0.389032	-0.079693
	(0.40360)	(0.04662)	(0.13949)	(0.21960)	(0.05811)
	(0.68473)	(-1.20123)	(-4.32570)	(-1.77152)	(-1.37150)
DLIMPORTS(-1)	-0.493969	0.085768	0.291216	-0.127296	0.082465
	(0.27207)	(0.03143)	(0.09403)	(0.14804)	(0.03917)
	(-1.81557)	(2.72903)	(3.09698)	(-0.85987)	(2.10525)
DLPOL_RISK(-1)	-0.058391	0.292837	0.726221	0.004169	0.052793
	(0.94742)	(0.10944)	(0.32744)	(0.51551)	(0.13640)
	(-0.06163)	(2.67579)	(2.21787)	(0.00809)	(0.38704)
C	0.040720	0.004002	-0.008959	-0.027389	-0.001133
	(0.02175)	(0.00251)	(0.00752)	(0.01183)	(0.00313)
	(1.87255)	(1.59342)	(-1.19206)	(-2.31477)	(-0.36184)
R-squared	0.192240	0.296988	0.361280	0.273711	0.100256
Adj. R-squared	0.114571	0.229391	0.299865	0.203876	0.013742
Sum sq. resids	1.237727	0.016515	0.147844	0.366446	0.025655
S.E. equation	0.154280	0.017821	0.053321	0.083947	0.022212
Log likelihood	29.26940	154.4552	90.89072	64.56766	141.6814
Akaike AIC	29.47630	154.6621	91.09762	64.77456	141.8883
Schwarz SC	29.68944	154.8753	91.31077	64.98771	142.1014
Mean dependent	0.041862	0.003924	-0.004516	-0.012942	-0.001370
S.D. dependent	0.163958	0.020301	0.063725	0.094083	0.022366
Determinant Residual Covariance		2.50E-14			
Log Likelihood		496.7361			
Akaike Information Criteria		497.7706			
Schwarz Criteria		498.8363			

(ii) Impulse Response Functions

Response to One S.D. Innovations ± 2 S.E.



(iii) Variance Decompositions

Variance Decomposition of DLEMBIPRO:

Period	S.E.	DLEMBIPRO	DLDEPOSITS	DLRECAUD	DLIMPORTS	DLPOL_RISK
1	0.146083	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.158831	91.68486	3.835118	0.112104	4.362202	0.005713
3	0.163096	87.69037	7.244177	0.207663	4.480810	0.376978
4	0.164484	86.60354	7.835709	0.204200	4.674678	0.681873
5	0.165081	86.07690	8.192186	0.215003	4.751962	0.763952
6	0.165282	85.91640	8.306047	0.214934	4.768082	0.794536
7	0.165363	85.84839	8.348129	0.215433	4.779515	0.808529
8	0.165393	85.82352	8.365770	0.215581	4.782350	0.812783
9	0.165404	85.81423	8.371780	0.215613	4.783694	0.814683
10	0.165409	85.81060	8.374235	0.215639	4.784182	0.815345

Variance Decomposition of DLDEPOSITS:

Period	S.E.	DLEMBIPRO	DLDEPOSITS	DLRECAUD	DLIMPORTS	DLPOL_RISK
1	0.016874	5.892666	94.10733	0.000000	0.000000	0.000000
2	0.019337	7.738253	76.68230	0.001617	5.883758	9.694074
3	0.020204	7.939735	76.00374	0.290661	6.354741	9.411126
4	0.020449	8.337228	75.34968	0.284838	6.452618	9.575635
5	0.020558	8.395966	75.09127	0.297331	6.584735	9.630698
6	0.020595	8.433268	75.03388	0.297724	6.597985	9.637147
7	0.020610	8.446401	74.99783	0.297928	6.611695	9.646143
8	0.020615	8.450763	74.98812	0.298212	6.615272	9.647636
9	0.020617	8.452746	74.98374	0.298229	6.616707	9.648576
10	0.020618	8.453396	74.98213	0.298260	6.617321	9.648894

Variance Decomposition of DLRECAUD:

Period	S.E.	DLEMBIPRO	DLDEPOSITS	DLRECAUD	DLIMPORTS	DLPOL_RISK
1	0.050488	9.368210	1.697509	88.93428	0.000000	0.000000
2	0.061986	9.016540	8.966953	68.74649	7.468317	5.801701
3	0.062827	9.534781	9.441760	67.31379	7.996151	5.713517
4	0.063154	9.475836	9.371637	66.63155	8.483720	6.037257
5	0.063235	9.467766	9.578466	66.46976	8.461851	6.022154
6	0.063254	9.479967	9.580870	66.43333	8.467729	6.038106
7	0.063263	9.479149	9.595994	66.41595	8.470297	6.038607
8	0.063265	9.480415	9.599278	66.41118	8.470086	6.039043
9	0.063266	9.480568	9.600441	66.40898	8.470565	6.039445
10	0.063266	9.480658	9.601073	66.40821	8.470573	6.039486

Variance Decomposition of DLIMPORTS:

Period	S.E.	DLEMBIPRO	DLDEPOSITS	DLRECAUD	DLIMPORTS	DLPOL_RISK
1	0.079486	1.127737	4.085083	22.45058	72.33660	0.000000
2	0.092463	2.851045	19.86687	22.95546	54.32653	8.59E-05
3	0.093782	3.622430	19.69655	23.40880	52.81627	0.455941
4	0.094210	3.596917	19.86150	23.42333	52.62816	0.490100
5	0.094262	3.629372	19.88450	23.40842	52.58810	0.489599
6	0.094286	3.630964	19.87844	23.39704	52.58691	0.506647
7	0.094293	3.631714	19.88812	23.39413	52.57942	0.506615
8	0.094295	3.632636	19.88825	23.39331	52.57813	0.507669
9	0.094295	3.632731	19.88899	23.39296	52.57749	0.507828
10	0.094296	3.632836	19.88917	23.39284	52.57726	0.507890

Variance Decomposition of DLPOL_RISK:

Period	S.E.	DLEMBIPRO	DLDEPOSITS	DLRECAUD	DLIMPORTS	DLPOL_RISK
1	0.021032	0.122929	9.87E-07	1.085061	3.235715	95.55629
2	0.021933	0.838037	0.938036	1.132190	8.981417	88.11032
3	0.022168	1.008100	2.745425	1.137043	8.854056	86.25538
4	0.022233	1.140059	2.776974	1.140218	8.977865	85.96488
5	0.022261	1.152602	2.953003	1.153993	8.982757	85.75765
6	0.022268	1.170063	2.978392	1.153797	8.981737	85.71601
7	0.022271	1.173278	2.991717	1.154074	8.985804	85.69513
8	0.022272	1.175007	2.997536	1.153997	8.985706	85.68775
9	0.022272	1.175647	2.999159	1.153966	8.986036	85.68519
10	0.022273	1.175861	2.999976	1.153965	8.986094	85.68410

Ordering: DLEMBIPRO DLDEPOSITS DLRECAUD DLIMPORTS DLPOL_RISK

Appendix 2: A Simple Game-theoretic approach to Country/IMF Strategic Interactions

In this section, I describe a very simple model to fix ideas. The model can be thought of as a three player game where the actors are 1) the country, 2) the IMF and 3) private sector lenders. In what follows we consider different temporal structures of the game. Let us suppose for simplicity that we restrict the potential actions of each to a bi-variate decision. In particular that the country must decide a Safe strategy or a Risky, the IMF must decide whether to Assist or Not Assist and the private sector must decide whether to Lend or to Run.

2a. A simultaneous game between the IMF and the Country

This game with three players, each with two possible actions, has eight potential outcomes. We represent the game in extensive form in Figure 2.i. However, in what follows we restrict the outcomes in a way that depends on some other features of the problem. In a first case, let us assume that there is a simultaneous game between the IMF and the country and then the private sector conditions its decisions on the outcome of that game and in particular, on what the IMF does. This inter-temporal structure can be justified in at least two different ways. First, the private sector is making decisions every second in real time, whereas, IMF and country policy discussions have more of a defined structure and timetable. Second, the private sector, as it is composed of many different actors, may be thought of as incapable (or less capable) of making any commitment. Hence, its actions must be conditioned on the actions of others. However, as we discuss below, one interpretation of the current debate is precisely to attempt to change the inter-temporal structure of this game. We therefore explore different sequential structures below. It should

come as no great surprise that the results are highly sensitive to the particular assumed inter-temporal structure.

(Figure 2.i here)

Furthermore, we assume that the private sector's actions crucially depend on those of the IMF's. In particular, we assume that the private sector Runs unless the IMF Assists. This may seem a harsh assumption but, it makes little difference if instead we say that there is a greater probability of the private sector running without IMF assistance so long as that greater probability results in expected payoffs that satisfy certain conditions we outline below. Hence, while this particular assumption is harsh, weaker assumptions along the same lines would similar results and it does reflect reality in a way that the IMF, and the country, must take into account.

At least two more theoretical interpretations for this assumption are available. First, as discussed above the private sector has a severe co-ordination problem and hence may Run unless the IMF 'co-ordinates' in some fashion or by Assisting the IMF directly rules out a 'Run' equilibrium through its promise of liquidity. A second interpretation is that there is some (un-modelled) information problem and the private sector only trusts the country (and the IMF), if the IMF puts down its own money rather than any 'cheap talk' without committing resources. The assumption, that the private sector 'Runs', without IMF assistance, is how the 'liquidity' school argument is introduced into this version of the model. With this assumption there are then only four relevant outcomes (as in the standard prisoner's dilemma), as the private sector's action is really determined by the actions of the IMF.

As there are only four outcomes that depend on the actions of the country and the IMF, we can also represent the model in a two by two matrix as in Figure 2.ii. We label the

four potential outcomes: 1. First Best, 2. On Your Own, 3. Moral Hazard and 4. Worst Case. These labels refer to some general notion of world welfare and not the payoffs of particular players. The First Best is a case where the country plays Safe, the IMF Assists and the private sector Lends. The Worst Case is when the country plays Risky, the IMF does Not Assist and the private sector Runs. A third outcome is where the country plays Safe, the IMF does not Assist and the private sector Runs which we label as 'On Your Own'. It might also be referred to as the case where the discipline of the IMF and the private sector is most fully operating. The final outcome is that where the country plays Risky, the IMF Assists and the private sector Lends. This, we refer to as the Moral Hazard case.

(Figure 2.ii here)

Discussion of the payoffs

The equilibrium of this game naturally depends on the assumed payoffs. As the actions of the private sector are assumed to follow those of the IMF, it is only the payoffs of the IMF and the country that matter. Assume that the base case is the First Best and the payoffs, both for the country and IMF, are zero. We will write the payoffs as a vector with the first element, the payoff to the country and the second, the payoff to the IMF. Hence the payoffs are {Country, IMF}={0,0} in this case.

In order for there to be a moral hazard problem it must be the case that, given the IMF is Assisting, the country will prefer not to play Safe but would rather play Risky. We assume then, following the 'moral hazard school' that in the Moral Hazard outcome the payoffs are {C, -D} with C, D >0 where we assume that the country is better off and the IMF is worse off relative to the base case.

In the 'Worst Case', the country plays Risky, the IMF does Not Assist and the private sector Runs. Here we assume the payoffs are {-E,-F} where E,F>0. We assume that -D<-F or in other words, for the IMF, the Moral Hazard outcome is worse than the 'worst case' outcome. One interpretation of recent lobbying of the 'moral hazard' school economists is precisely to ensure that this is the case. We discuss this particular issue further in the next section as we note that recent authors have suggested otherwise.[62] For the country however the Worst Case outcome is the worst of all i.e.: -E is the lowest payoff the country may receive.

Finally, in the On Your Own outcome the payoffs are {-A,-B} (A,B>0) and we assume that –E<-A or in other words, for the country, while this is clearly worse than the base-case, if the IMF is not Assisting, On Your Own is preferred to the Worst Case. In other words, if the IMF does not Assist, it is then better for the country to play Safe and not Risky. This clearly makes sense thinking about lender Moral Hazard or in other words that the risky strategy is that the country is contracting too much debt at too low an interest rate as lenders believe that there is a high probability of them being 'bailed out'. We also assume that the payoff to the IMF here is –B where B>0. This implies that if the country is playing Safe, then the IMF would prefer to Assist than not to Assist.

Discussion of Potential Equilibria

If the country and the IMF are acting simultaneously, with the payoffs as defined above, it is simple to see that this game has no Nash equilibrium in pure strategies. In particular, start from the First Best. If the IMF is Assisting, the country then prefers to play

[62] See Eichengreen and Ruhl (2000).

Risky so the country prefers the Moral Hazard solution to the First Best. But if the country is playing Risky then the IMF prefers not to Assist and hence prefers the Worst Case to Moral Hazard. However, if the IMF is not Assisting and the private sector Runs, then the country prefers to play Safe (i.e.: the country prefers On Your Own to the Worst Case) but then if the country is playing Safe, the IMF should Assist and we are back to the First Best. Hence, there is no Nash equilibrium in pure strategies.

However, it is well known, that in such a situation there is, at least one, equilibrium in mixed strategies where the IMF plays randomly between Assist and No Assist and where the country plays randomly between Safe and Risky. In particular, suppose that the probability that the IMF plays Assist is p and the probability that the country plays Safe is q. It follows that, given the payoffs there is a particular pair of probabilities, p and q, that make the Country indifferent between playing Safe and playing Risky and that make the IMF indifferent between Assisting and not Assisting respectively. This probability pair then defines the mixed-strategy equilibrium.

To find the probability, p, that the IMF Assists in this equilibrium, consider the position of the country. To ensure that the country is indifferent between playing Safe and Risky, it must be the case that the expected payoff to the country from playing Safe, calculated using the probabilities of the IMF playing Assist or not, is equal to the expected payoff to the country of playing Safe, again weighted by the probabilities of the IMF Assisting or not. In mathematical terms:

$$p0 + (1-p)(-A) = pC + (1-p)(-E)$$

It then follows by rearranging this equation that:

$$p = \frac{E-A}{E-A+C}$$

The existence of 'moral hazard' is critical in the explanation of why there is no equilibrium in pure strategies and only in mixed strategies. If there were no 'moral hazard' then C would not be positive but would be zero or negative (C is the payoff to the Country if it plays Risky given the IMF Assists). If there was no moral hazard present, then the probability p would be unity (or would not be well-defined as it would be greater than one) and, if the other payoffs remained unchanged, then the Best Case would then be a pure-strategy equilibrium.

In similar vein, the probability that the country plays Safe, q, can also be found by considering the position of the IMF. The IMF will be indifferent to Assisting and or not Assisting if its expected payoff from playing Assist is equal to the expected payoff of not Assisting: i.e.: if:

$$q0 + (1-q)(-D) = q(-B) + (1-q)(-F)$$

Rearranging this equation we find that:

$$q = \frac{D - F}{D - F + B}$$

It is easy to check from our assumptions regarding payoffs above that $0<p<1$ and $0<q<1$.

One interpretation of the mixed strategy equilibrium is the 'case by case' approach to countries with international payments' difficulties that has indeed been the norm. There is a close analogy here between the 'case by case' approach applied to countries and the apparent affinity for 'Constructive Ambiguity' of central banks when it comes to helping banks in distress. There are at least two interpretations of the reasons why 'case by case' or 'Constructive Ambiguity' may be useful. One is that the world is just too complex to write down the right set of rules and hence flexibility is required to deal with particular cases as

they arise. This might be referred to as the 'incomplete contracts' view. However, the other interpretation is that 'case by case' or 'Constructive Ambiguity' really implies unpredictability. As we show in the game above, if there is 'moral hazard', and other conditions are met, then unpredictability may be necessary for there to be an equilibrium. Under this interpretation, to ensure an equilibrium the IMF must never Assist with certainty, and the country will respond by never being absolutely clear that it will play Safe in order for each to be content given the strategy of the other.[63]

It is interesting to note that the probability that the country plays Safe depends on the relationship between (D-F) and B: the payoffs to the IMF. If (D-F) is large, relative to B, then the probability that the country will play Safe, in this mixed strategy equilibrium, increases. This means that if the Moral Hazard outcome is very bad for the IMF compared to the Worst Case outcome (this is summarised by the difference, D-F), then the probability that the country plays Safe rises in equilibrium. On the other hand if (D-F) is reduced, the probability that the country plays Safe diminishes.

The welfare of the country in the mixed strategy equilibrium is equal to (1-p)(-A) or -AC/(E-A+C).[64] This is increasing in E but decreasing in A and C. This implies that, for

[63] In Gavin and Powell (1999), we developed a slightly more complex model with imperfect information where the IMF prefers a mixed strategy equilibrium to a Nash equilibrium in pure strategies where the IMF always Assists in the case of a systemic problem and never Assists in the case of an individual problem giving a slightly different interpretation of the Constructive Ambiguity doctrine. See Fischer (2001) for a further discussion of the analogy between 'case by case' and the 'constructive ambiguity' doctrine of central banks and the interpretation that such approaches are in part designed to control 'moral hazard'.

[64] Note that in the Nash, mixed strategy equilibrium, the country is indifferent to playing Safe or Risky by definition and so the payoff to the country can be calculated as simply the payoff to playing Safe.

example, increasing E (i.e.: making –E more negative, making the Risky strategy combined with non-assistance from the IMF more painful for the country), would actually increase country welfare in the equilibrium – as the IMF would have to Assist more frequently for an equilibrium to be found. This is somewhat analogous to the result that increasing the pain of a country in default might actually make a country better off, ex ante, as it would support greater private lending although the mechanism for this result here is quite different.

2b. Repeating the game: the opportunities for cooperation

Let us now go back to the original game with simultaneous play between the country and the IMF but ask what might happen assuming this game is repeated. In the one shot game, the only equilibrium was one in mixed strategies. And given the assumption of simultaneous play, the country could not commit to a Safe strategy nor could the IMF commit to only Assist if the country played Safe.

However, in a repeated game there may be an opportunity for cooperation between the IMF and the country. Note that the best outcome for the IMF is the First Best. Suppose that the IMF offers the First Best but with the threat that if the country deviates (and plays Risky to obtain the Moral Hazard outcome), then the IMF will respond with the Nash (mixed strategy) equilibrium forever. As we had before, the payoff to the country in the Nash equilibrium is equal to (1-p)(-A) and the country is then clearly worse off than that in

the First Best, which is equal to zero. It is possible then, that the First Best can be attained through this approach.[65]

In this example, the country must weigh up the welfare of staying in the First Best forever, which is equal to zero, versus the alternative of deviating and obtaining the payoff, C, from the Moral Hazard outcome for one period and then welfare of the mixed strategy equilibrium for the rest of time. The First Best can then be supported if:

$$C + \frac{\delta}{1-\delta}(1-p)(-A) < 0$$

Where δ is the discount factor of the country and hence the second term on the left hand side gives the payoff to playing the Nash equilibrium forever, discounted by one period[66]. Substituting for p in terms of the payoffs and rearranging, this yields the following condition for the First Best to be supported:

$$\delta > 1 - \frac{A}{C+E}$$

By our original assumptions A, C, E >0 so we know that this gives a threshold discount factor of less than one[67]. The larger is C (the payoff from deviating and obtaining the

[65] Naturally this is only one potential 'cooperative' outcome. The IMF might, for example, be able to impose On Your Own on the country forever where the IMF does not Assist and the Country prefers to play Safe. On Your Own in this game is the country's security level (or Max-Min) in the sense that it gives the best payoff for the country assuming that the IMF will always choose the worst action for the country given the country's choice. However whether this is a credible threat is a complex issue that we do not discuss further here – see Fudenberg and Maskin (1986).

[66] The discount factor δ (0<δ<1) can be thought of as (1/(1+r)) where r is the positive discount rate.

[67] We note that if C+E>A, then the threshold discount factor is greater than zero too, although there is no obvious reason why that is the case. If then C or E are sufficiently small or A sufficiently large (subject to the

Moral Hazard outcome for one period), then the higher is the threshold discount factor or in other words, if C is large then the country must weight future payoffs more highly for the First Best to be supported. This is because increasing C increases the reward from deviation. The threshold discount factor also rises if E is increased. If the country's pain from playing Risky and the IMF not Assisting is greater, then as the welfare in the Nash equilibrium rises, the discount factor now has to be greater to support the First Best. Perhaps, somewhat surprisingly then, if we presume default is most likely in the scenario where the country plays Risky and the IMF does not Assist and then default is made less costly, then the First Best has more chance of being supported. This result appears to go against the standard view of a trade-off between ex ante provision of credit and the ex post efficiency of default resolution and provides support for 'collective action' clauses in bond contracts.

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restrictions to obtain the unique Nash mixed strategy equilibrium), any positive discount factor would support the First Best.

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