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Department of
Economics and Finance

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**2 ' , 3 ' ( ! , 3 %! % 4 0 # 5 # ( %6!!**

***!& # ( ) - " % " # 0 7 ! * 1 1 0 # * / 3 !**

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**) 89:;<: = >! " ?@;?! / ?A>@?:<!**
**B@8C<:! 4 C;D<@E;FG!&>CH>CI! 4 J !**
**!**
**&8;E! * K! ) ;:- * :?C?!**
**4 C;D<@E;FG!>L! ( ?D?@@?I! 1 ? = A:>C?I!+A?;C!**
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**!**
**# MF>N<@!OPOP!**

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*** NEF@?MF!**

!"#$%&'&()%*$($%+)',-#./'0%#/-(1)'-#./%'/2%,.#/-(1)'-#./%3(-".2$%-.%'/'04$(%-"(%2(-()3#/'/-$%
.+%-"(%'3.*/-%.+%0.'/$%&).5#2(2%-.%/./6+#/'/,#'0%,.)&.)'-#./$%789:$;%2*)#/1%-"(%0'$-%-")((%
2(,'2($%#/%+.*)% <*).=./(%,.*/-)#($>% /'3(04% ?()3'/4>% 9)'/,(>% @-'04% '/2% A&'#/B% C.)(%
$&(,#+#,'004>% DE9@CD% 7D*-.E(1)($$#5(% 9)',-#./'004% @/-(1)'-(2% C.5#/1% D5()'1(;% '/2%
9:FDE%79)',-#./'004%:.#/-(1)'-(2%F(,-.)%D*-.)(1)($$#./;%3.2(0$%')(%($-#3'-(2%'/2%-"(/%
+.)(,'$-$% ')(%'0$.%&).2*,(2B! D00% $()#($% ')(%+.*/2%-.%G(%"#1"04% &()$#$-(/-% '/2%0./16)*/%
(H*#0#G)#*3%)(0'-#./$"#&$%G(-I((/%-"(3%')(%'0$.%#2(/-#+#(2>%,./+#)3#/1%-"(%).0(%.+%)('0%?JK%
'/2%)('0%1).$$%#/5($-3(/-%'$%2(-()3#/'/-$%.+%0.'/$%-.%89:$B%!"(-33.9(!)10005 0N()-33.6(3%)-38.#+#(2



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.+%-"(%2(,)('$#/1%#/+0*(/,(%.+%5')#.*$%2(3'/26$#2(%'/2%$*&&046$#2(%+',-.)$%)(0'-(2%-.%-"(%10.G'0%+#/'/,#'0%,)#$#$%.+%M]]_6R%I"#,"%"'2%2(&)($$(2%0(/2#/1%0(5(0$B%

?#5(/%-"(#)%#3&.)-'/,(%#/%'%<*).&('/%,./-(V->%-"#$%&'&()%'/'04$($%-"(%2(-()3#/'/-$%.+%-"(%'3.*/-%.+%0.'/$%&).5#2(2%-.%89:$%#/%+.*)%,.*/-)#($%G(0./1#/1%-.%-"(%<*).=./(%7?()3'/4>%9)'/,(>%@-'04%'/2%A&'#/;B%!"(%(3&#)#,'0%+)'3(I.)Z%#$%G'$(2%./%+)',-#./'0%#/-(1)'-#./%'/2%,.#/-(1)'-#./%3(-".2$%$#/,(%3.$-%3',).(,./.3#,%$()#($%'&&(')%-.%(V"#G#-%0./163(3.)4%.)%0./16)'/1(%2(&(/2(/,(%7/'3(04>%-"(#)%'*-.,.))(0'-#./$%2.%/.-%2(,'4%(V&./(/-#'004%G*-%)'-"()%',,.)2#/1%-.%'%"4&()G.0#,%$"'&(;>%I"#,"%3'Z($%@72;%&).,($$($%-"(%3.$-%'&&).&)#'-(%-.%3.2(0%-"(3%$#/,(%#-%'00.I$%$".,Z$%-.%"'5(%0./160'$-#/1%(++(,-$B%%

!"(%0'4.*-%.+%-"(%&'&()%#$%'$%+.00.I$B%A(,-#./%M%)(5#(I$%-"(%0#-()'-*)(%./%3.2(00#/1%0.'/$%-.%89:$>%I#-"%'%+.,*$%./%<*).&(B%A(,-#./%N%.*-0#/($%-"(%+)',-#./'0%#/-(1)'-#./%'/2%,.#/-(1)'-#./%3(-".2$%*$(2%+.)%-"(%'/'04$#$B%A(,-#./%^%2($,)#G($%-"(%2'-'B%A(,-#./%O%2#$,*$$($%-"(%(3&#)#,'0%)($*0-$B%A(,-#./%a%.++()$%$.3(%,.,0*2#/1%)(3')Z$B%

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**OK!  &;F<@?F8@<!0<D;<Q!%**

A#/,(%-"(%(')04%P``]$%'%5'$-%0#-()'-*)(%"'$%2(5(0.&(2%./%3.2(00#/1%,)(2#-%-.%-"(%&)#5'-(%$(,-.)>%($&(,#'004%I#-"#/%-"(%,(/-)'0%G'/Z#/1%,.33*/#-4%1#5(/%#-$%&.0#,4%)(0(5'/,(



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'/'04$(2%?()3'/%2'-'%*$#/1%'%O65')#'G0(%F<:C%Q(%+.*/2%-I.%,.#/-(1)'-#/1%)(0'-#./$"#&$%
I"#,"%"(%#/-()&)(-(2%'$%-"(%,)(2#-%2(3'/2%'/2%-"(%,)(2#-%$*&&04%(H*#0#G)#'>%I#-"%,)(2#-%2(3'/2%
)(5()-#/1%)'-"()%$0.I04%-.%#-$%0./16)*/%(H*#0#G)#*3%'/2%$*&&04%(++(,-$%-").*1"%-"(#)%#3&',-%./%
0(/2#/1%)'-($%G(#/1%#/$#1/#+#,'/-B%:'0='%(-%'0B%7M]]a;%($-#3'-(2%'%^65')#'G0(%F<:C%+.)%-"(%
<*).=./(%'/2%2(-(,-(2%./(%,.#/-(1)'-#./%)(0'-#./$"#&%#/-()&)(-(2%'$%-"(%,)(2#-%2(3'/2%
(H*#0#G)#*3B%?'3G',.)-'%'/2%E.$$#%7M]P];%#/5($-#1'-(2%&.$$#G0(%/./60#/(')#-#($%#/%-"(%
)($&./$(%.+%G'/Z%0(/2#/1%-.%3./(-')4%&.0#,4%$".,Z$%#/%-"(%<*).=./(%.5()%-"(%&()#.2%P`RO6
M]]O%G4%3('/$%.+%'/%D$433(-)#,%F(,-.)%<)).)%:.))(,-#./%C.2(0%7DF<:C;%#/5.05#/1%+.*)%
(/2.1(/.*$%5')#'G0($>%'/2%+.*/2%-"'-%-"(%(++(,-%./%,)(2#->%?JK%'/2%&)#,($%.+%'%3./(-')4%&.0#,4%
-#1"-(/#/1%I'$%0')1()%-"'/%-"'-%.+%'%3./(-')4%&.0#,4%('$#/1B%!"#$%)($*0-%$*&&.)-(2%-"(%(V#$-(/,(%
.+%'/%'$433(-)#,%,)(2#-%,"'//(0%#/%-"(%<*).=./(B%%

f-"()%$-*2#($%"'5(%+.,*$(2%./%G*$#/($$%0(/2#/1%#/%#/2#5#2*'0%<*).=./(%,.*/-)#($B%
9.,')(00#%'/2%E.$$#%7P``R;%$&(,#+#(2%'%O65')#'G0(%F<:C%3.2(0%'/2%+.*/2%-")((%,.#/-(1)'-#/1%
)(0'-#./$"#&$>%/'3(04%0.'/%2(3'/2>%'%)(0'-#./$"#&%G(-I(((/%#/5($-3(/-%'/2%G.)).I#/1%
)(H*#)(3(/-$%'/2%-"(%0(/2#/1%)'-(%(H*'00#/1%)#$Z6+)((%1.5()/3(/-%G./2%4#(02$B%S)#21(/%'/2%
C#=(/%7P```;%#/5($-#1'-(2%-"(%#/-()',-#./$%G(-I(((/%#/5($-3(/-%3./(4%".02#/1%'/2%G'/Z%
G.)).I#/1%G4%&)#5'-(%89:$%'/2%#2(/-#+#(2%0./16)*/%)(0'-#./$"#&$%+.)%#/5($-3(/-%3./(4%'/2%
G.)).I#/1>%I#-"%-"(%24/'3#,$%#/2#,'-#/1%-"(%(V#$-(/,(%.+%+((2G',Z%+).3%3./(4%'/2%,)(2#-%
2#$(H*#0#G)#'%./-.%#/5($-3(/-B%S)#21(/%'/2%C#=(/%7M]]^;%+.*/2%(H*#0#G)#*3%)(0'-#./$"#&$%+.)%
#/5($-3(/-%0(/2#/1%'/2%3./(4%I#-"%,'*$'0%0#/Z'1($%)*//#/1%+).3%3./(4%'/2%0(/2#/1%-.%
#/5($-3(/-%'/2%+).3%3./(4%-.%0(/2#/1%#/%'%24/'3#,%3.2(0B%W'Z($%7M]]];%'/'04$(2%-"(%).0(%
.+%G'/Z%0(/2#/1%#/%-"(%3./(-')4%-)'/$3#$$#./%3(,"'/#$3%#/%?()3'/4%+.00.I#/1%'%$(,-.)'0%
'&&).',"%'/2%2#$-#/1*#$"#/1%G(-I(((/%,.)&.)'-(%0(/2#/1%".*$(".02%0(/2#/1L%-"(4%)(&.)-(2%-"'-%
G'/Z$%)($&./2%-.%'%3./(-')4%,./-)',-#./%G4%'2*$-#/1%-"(#)%$(,*)#-4%".02#/1$%)'-"()%-"'/%G4%

)(2*,#/1%-"(#)%0.'/$%&.)-+.0#.B%9#/'004>%K0'$#0%(-%'0B%7M]PN;%$".I(2%-"'-%:=(,"%G'/Z$%"'2%-.%

)($-)#,-%,)(2#-%

I '$%-.%*$(%2(-()3#/#$-#,%70#/(')%.)%H*'2)'-#,;%+*/,-#./$%.+%-#3(>%-"*$%'$$*3#/1%-"'-%-"(%)($#2*'0$%+).3%-"(%)(1)($$#./%3.2(0%I()(%@7];%$-'-#./')4B%U'-()%./>%'/2%($&(,#'004%'+-()%-"(%$(3#/'0%I.)Z%.+% 8(0$./%'/2%K0.$$()%7P`RM;>% '%1(/()'0%,./$(/$*$% I '$%)(',"(2%-"'-%-"(%/./6$-'-#./')4%,.3&./(/-%.+%3.$-%$()#($%I'$%$-.,"'$-#,>%'/2%*/#-%)..-$%7.)%+#)$-%2#++()(/,($>%@7P;;%I()(%3.$-%'&&).&)#'-(%+.)%-"(3B%Q.I(5()>%-"(%@7P;%,'$(%#$%3()(04%./(%&')-#,*0')%3.2(0%-"'-%,'/%2($,)#G(%$*,"%G("'5#.*)B%@/%+',->%-"(%/*3G()%.+%2#++()(/,($%)(H*#)(2%-.%','"#(5(%@7];%$-'-#./')#-4%#$%/.-%/(,($$')#04%'/%#/-(1()%5'0*(%G*-%,.*02%G(%'/4%&.#/-%./%-"(%)('0%0#/(>%#/,0*2#/1%+)',-#./'0%5'0*($B%@/%-"(%0'--()%,'$(>%-"(%&).,($$%#$%'#2%-.%G(%+)',-#./'004%#/-(1)'-(2%.)%@72;B%

U./1% 3(3.)4%#$% '%+('-*)(%.+% .G$()5'-#./$%-"'-% ')(%+')% '&')-%#/%-#3(%G*-% "#1"04%,.))(0'-(2B%!"#$%,'/%G(%,'&-*)(2%G4%+)',-#./'004%#/-(1)'-(2%.)%@72;%3.2(0$%.+%-"(%+.)3X%

% % % % %7P;%

I "()(%2%,'/%G(%'/4%)('0%5'0*(>%U%#$%-"(%

-"(%.G$()5'-#./$%')(%7I('Z04;%'*-.,.))(0'-(2%7(B1B%DE;>%-"(/%-"(%5'0*($%#/%-"(%'*-.,.))(0'-#./$%

2(,'4%(V&./(/-#'004%+'$-L%#+%2%j%]>%V¡%#$%$'#2%-.%G(%0./1%3(3.)4>%$.%,'00(2%G(,'*$(%.+%-"(%$-).1%

f-"()%&')'3(-)#,%3(-".2$%-.%($-#3'-(%2%#/%-"(%+)(H*(/,4%2.3'#/%I()(%&).&.$(2%G4>%
'3./1%.-"()$>%9.V%'/2%!'HH*%7P`Ra;%'/2%J'0"'*$%7P`R`;B%!"(%$3'00%$'3&0(%&).&()-#($%.+%
-"($(%'/2%.-"()%($-#3'-.)$%I()(%(V'3#/(2%G4%Q'*$()%7P```;B%D%$(3#6&')'3(-)#,%+)(H*(/,4%
2.3'#/%($-#3'-.)%#$%-"(%0.16&()#.2.1)'3%($-#3'-.)%&).&.$(2%G4%?(I(Z(%'/2%K.)-()6Q*2'Z%
7P`RN;>%'/2%.-"()%$(3#6&')'3(-)#,%3(-".2$%"'5(%G((/%&*-%+.)I')2%G4%F(0'$,.%7P```'>%P```G;%
'/2%K"#00#&$%'/2%A"#3.-$*%7M]]^>%M]]O;%'3./1%.-"()$B%D/.-"()%'&&).',"%I#2(04%(3&0.4(2%#/%
-"(%(3&#)#,'0%0#-()'-*)(%'/2%'0$.%#/%-"(%&)($(/-%$-*24%#$%-"(%&')'3(-)#,%-($-#/1%&).,(2*)(%.+%
E.G#/$./%7P``^;>%I"#,"%#$%'%U'1)'/1(%C*0-#&0#()%7UC;%-($-%G'$(2%./%-"(%["#--0(%+*/,-#./%#/%
-"(%+)(H*(/,4%2.3'#/B%E.G#/$./%7P``^;%$".I(2%-"'->%*/2()%,()-'#/%5()4%3#02%)(1*0')#-4%
,./2#-#./$>%#-$%UC6G'$(2%$-'-#$-#,%,./5()1($%'$43&-.-#,'004%-.%'%$-'/2')2%87]>%P;%2#$-)#G*-#./>%
'/2%-"#$%0#3#-%G("'5#.*)%".02$%#/2(&(/2(/-04%.+%-"(%*$(%.+%(V.1(/.*$%)(1)($$.)$%7.)%
2(-()3#/#$-#,%-()3$;%'/2%-"(%$&(,#+#,%3.2(00#/1%'$$*3&-#./$%'G.*-%-"(%@7];%2#$-*)G'/,($B%!"(%
-($-$%.+%E.G#/$./%7P``^;%I()(%'&&0#(2%-.%'/%(V-(/2(2%5()$#./%.+%-"(%8(0$./%'/2%K0.$$()d$%
7P`RM;%2'-'$(-%#/%?#06D0'/'%'/2%E.G#/$./%7P``_;%-.%-($-%+.)%*/#-%)..-$%'/2%.-"()%0./163(3.)4%
&).,($$($%I"(/%-"(%$#/1*0')#-4%'-%-"(%$&(,-)*3%.,,*))(2%'-%-"(%=().%+)(H*(/,4>%'$%#/%-"(%,'$(%
#/%-"(%$()#($%'/'04$(2%"()(B%A*,"%-($-$%"'5(%/.-%G((/%&)(5#.*$04%'&&0#(2%-.%'/'04$(%-"(%
&).5#$#./%.+%0.'/$%-.%89:$B%%

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**UKO! ,S<!.@?MF;>C?::G!/>;CF<9@?F<H!V<MF>@!*8F>0<9@<EE;D<!W./V*0X!">H<:! !**

!"(%9)',-#./'004%:.#/-(1)'-(2%F(,-.)%D*-.E(1)($$#5(%79:FDE;%3.2(0%I'$%#/-).2*,(2%G4%
c."'/$(/%7M]]R;%'/2%+*)-"()%2(5(0.&(2%G4%c."'/$(/%'/2%8#(0$(/%7M]P]>%M]PM;B%@-%#$%'%
1(/()'0#$'-#./%.+%c."'/$(/m$%7P``O;%:.#/-(1)'-(2%F(,-.)%D*-.E(1)($$#5(%7:FDE;%3.2(0%
I"#,"%'00.I$%+.)%+)',-#./'0%&).,($$($%.+%.)2()%2%-"'-%,.#/-(1)'-(%I#-"%.)2()%26GB%@/%.)2()%-.%
#/-).2*,(%-"(%9:FDE%3.2(0%I(%$-')-%+).3%-"(%I(006Z/.I/>%/./6+)',-#./'0>%:FDE%3.2(0B%U(-%
$Y_t!t=$#!"""T%G(%'%&62#3(/$#./'0%@7P;%-#3(%$()#($B%!"(/%-"(%:FDE%3.2(0%,'/%G(%(V&)($$(2%'$X%

B% % 7M;%

% !"(%$#3&0($-%I'4%-.%2()#5(%-"(%9:FDE%3.2(0%#$%-.%)(&0',(%-"(%2#++()(/,(%'/2%0'1%%
.&()'-.)$%n%'/2%U%#/%7M;%G4%-"(#)%+)',-#./'0%,.*/-()&')-$> '/2% >%)($&(,-#5(04B%%
f/(%-"(/%.G-'#/$X%

%% % % % % 7N;%

I"#,"%#$%'&&0#(2%-.% $*,"%-"'-X%

% % 7^;%
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I"()(% %#$%&62#3(/$#./'0%#/2(&(/2(/-%'/2%#2(/-#,'004%2#$-)#G*-(2% I#-"% 3('/%=().%'/2%
,.5')#'/,(%3'-)#V% B%

!"(%&')'3(-()$%"'5(%-"(%$'3(%#/-()&)(-'-#./%'$%#/%-"(%:FDE%3.2(0B%@/%&')-#,*0')>%o%
'/2%p%')(% 3'-)#,($>%I"()( B%!"(%,.0*3/$%.+%p%

c."'/$(/%'/2%8#(0$(/%7M]PM;%'/2%8#(0$(/%'/2%C.)#/%7M]P^;%2#$,*$$%($-#3'-#./%'/2%#/+()(/,(%
.+%-"#$%3.2(0>%-"(%0'--()%&).5#2#/1%C'-0'G%,.3&*-()%&).1)'3$%+.)%-"(%,'0,*0'-#./%.+%($-#3'-.)$%
'/2%-($-%$-'-#$-#,$B%

% @-%#$%/.-(I.)-"4%-"'-%+)',-#./'0%2#++()(/,#/1%#$%2(+#/(2%#/%-()3$%.+%'/%#/+#/#-(%$()#($%G*-%
'/4%',-*'0%$'3&0(%I#00%#/,0*2(%./04%'%+#/#-(%/*3G()%.+%.G$()5'-#./$B%@/%.)2()%-.%,'0,*0'-(%-"(%
+)',-#./'0%2#++()(/,($%./(%,'/%'$$*3(%-"'-%q!%I'$%=().%G(+.)(%-"(%$-')-%.+%-"(%$'3&0(B%!"(%G#'$%
#/-).2*,(2%G4%-"#$%'$$*3&-#./%#$%'/'04$(2%G4%c."'/$(/%'/2%8#(0$(/%7M]P^;%*$#/1%"#1"()6.)2()%
(V&'/$#./$B%!"(4%$".I(2%-"'-%#-%,'/%G(%,.3&0(-(04%'5.#2(2%G4%#/,0*2#/1%'%0(5(0%&')'3(-() %
-"'-%$"#+-$%(',"%.+%-"(%$()#($%G4%'%,./$-'/-B%%%

!"(%($-#3'-(2%(3&)#,'0%3.2(0%#$%-"(%+.00.I#/1X%

% % 7a;%



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% 9#1*)(%P%2#$&0'4$%-"(%-#3(%$()#($%&0.-$%.+%-"(%-")((%5')#'G0($%+.)%(',"%.+%-"(%+.*)%
,.*/-)#($%(V'3#/(2%'/2%2($,)#&-#5(%$-'-#$-#,$%')(%)(&.)-(2%#/%!'G0(%P%E('0%89:%0.'/$%-)(/2%
*&I')2$%-#00%-"(%(/2%.+%-"(%M]]]m$%(V,(&-%+.)%-"(%,'$(%.+%?()3'/4%I"()(%'%$#1/#+#,'/-%2(,0#/(%
.,,*))(2%'-%-"(%$-')-%.+%-"'-%2(,'2(>%'/2%I'$%+.00.I(2%G4%'/%#/,)('$(%'/2%-"(/%'%$*22(/%
2(,)('$(%G4%M]P]B%A#3#0')%+'00$%I()(%(V&()#(/,(2%#/%-"(%.-"()%,.*/-)#($>%A&'#/%G(#/1%-"(%3.$-%
/.-#,('G0(%,'$(B%E('0%?).$$%@/5($-3(/-%(V"#G#-$%'%$#3#0')%&'--()/%#/%9)'/,(>%@-'04%'/2%A&'#/>%
/'3(04%'%$#1/#+#,'/-%#/,)('$(%-#00%-"(%(/2%.+%-"(%0'$-%2(,'2(%+.00.I(2%G4%'%$"')&%+'00B%!"(%
(V,(&-#./%#$%?()3'/4%I"()(%-"#$%$()#($%+0*,-*'-(2%-").*1".*-%-"(%0'$-%-I.%2(,'2($B%9#/'004>%
-"(%G("'5#.*)%.+%)('0%?JK%$".I$%-"(%(++(,-$%.+%-"(%M]]_6R%10.G'0%+#/'/,#'0%,)#$#$X%#/%'00%+.*)%
,.*/-)#($%#-%+(00%$#1/#+#,'/-04%'/2%#-%'&&(')$%$-#00%-.%G(%$-'1/'-#/1>%I#-"%-"(%(V,(&-#./%.+%
?()3'/4%I"()(%-"()(%I()(%,0(')%$#1/$%.+%)(,.5()4B%%

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\K! **%=A;@;M?:!0<E8:FE!**

D$%'%+#)$-%$-(&%I(%,'))#(2%.*-%$-'/2')2%*/#-%)..-%($-$>%$&(,#+#,'004%-"(%DJ9%-($-%+).3%J#,Z(4%
'/2%9*00()%7P`_`;L%-"(%)($*0-$%,'/%G(%+.*/2%#/%-"(%D&&(/2#V>%I#-"%-"(%&65'0*($%#3&04#/1%#/%'00%
,'$($%-"'-%-"(%/*00%"4&.-"($#$%.+%'%*/#-%)..-%,'//.-%G(%)(\(,-(2%'/2%-"()(+.)(%-"(%$()#($%')(%/.-%
$-'-#./')4%#/%0(5(0$B%D0-".*1"%-"()(%,.*02%$-#00%(V#$-%'%0#/(')%,.3G#/'-#./%.+%-"($%$()#($%-"'-%#$%
$-'-#./')4>%#B(B%-"(4%,.*02%G(%,.#/-(1)'-(2%#/%-"(%$(/$(%.+%<10(%'/2%?)'/1()%7P`R_;%.)%c."'/$(/%
7P``O;>%'00%$*,"%,.#/-(1)'-#./%-($-$%+'#0%-.%#2(/-#+4%'/4%0./16)*/%(H*#0#G)#*3%)(0'-#./$"#&$%
0#/Z#/1%-"(%5.1(-)0(201T f.*0)0.2(2%)59(G()0.2(%)59(,)50cTJETQqQq2(#)0.0.2(1)')0.2(-)0.2(')0.TJETQ



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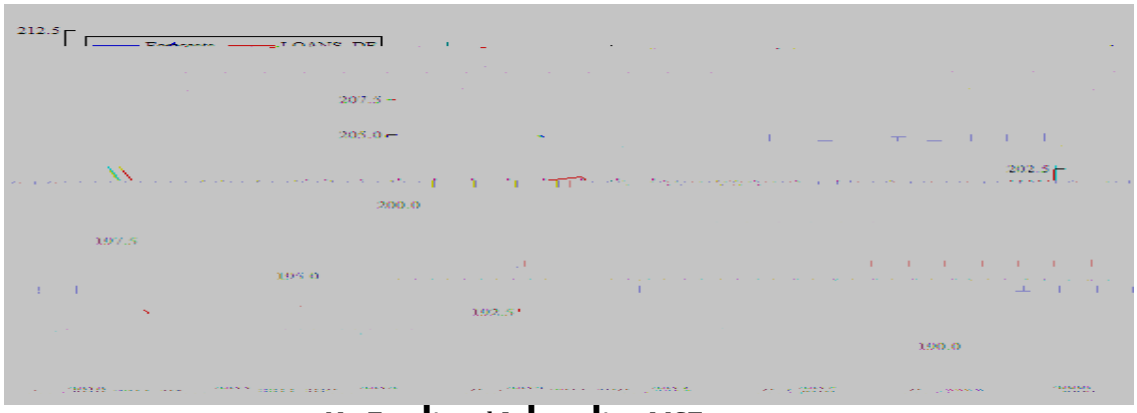

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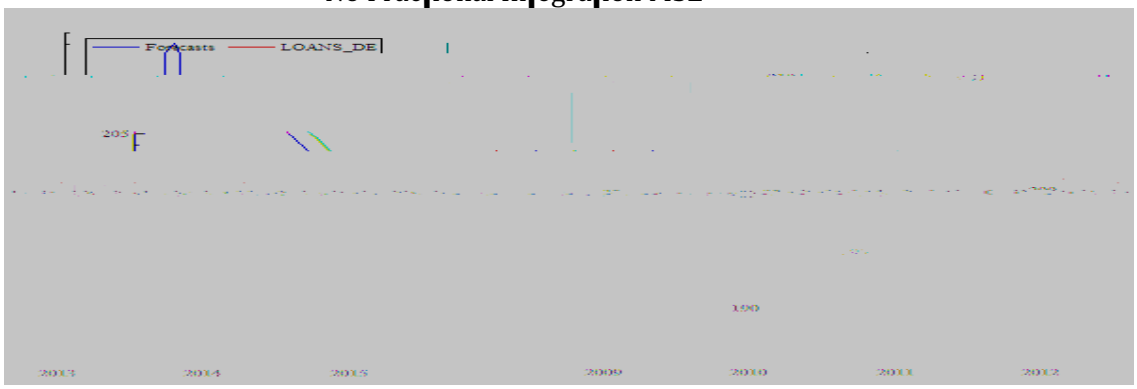

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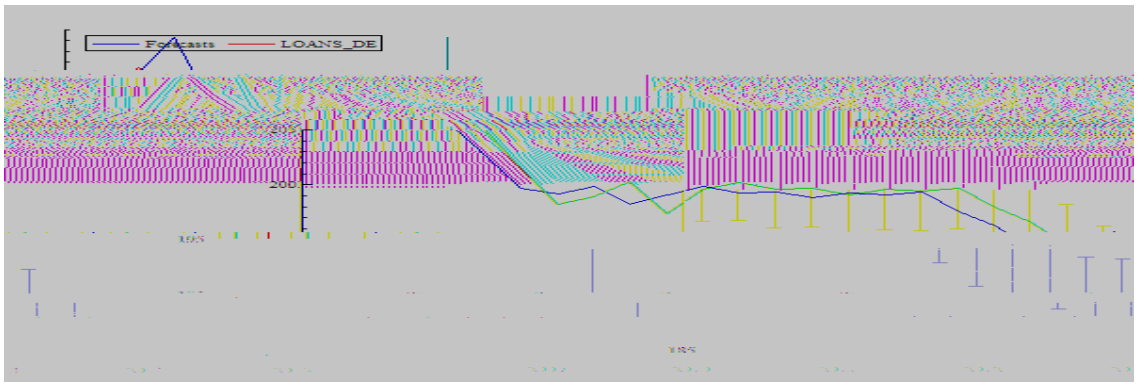

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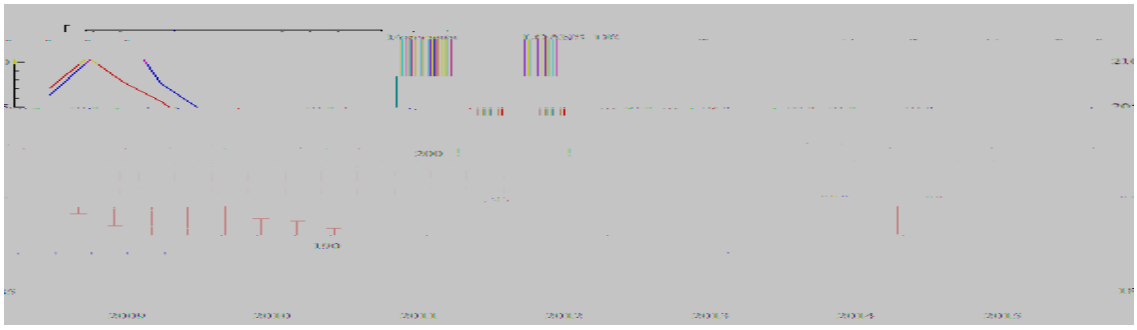

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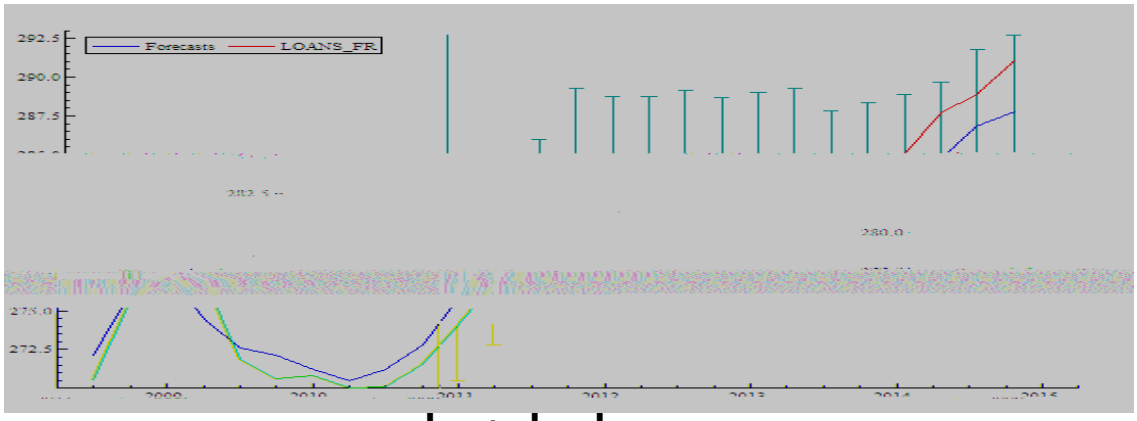


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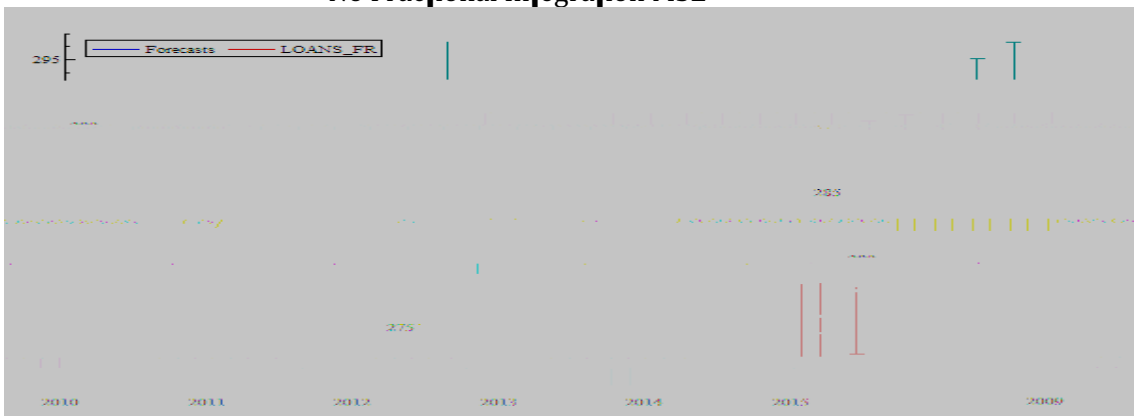


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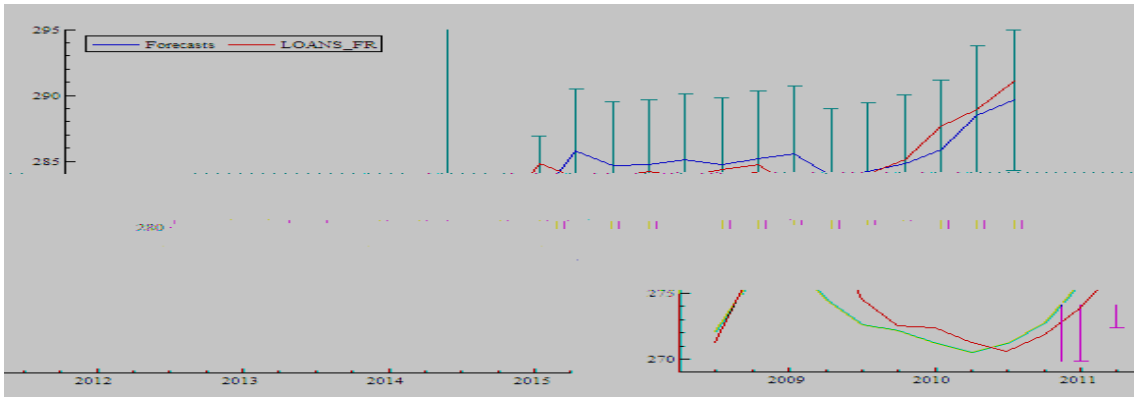


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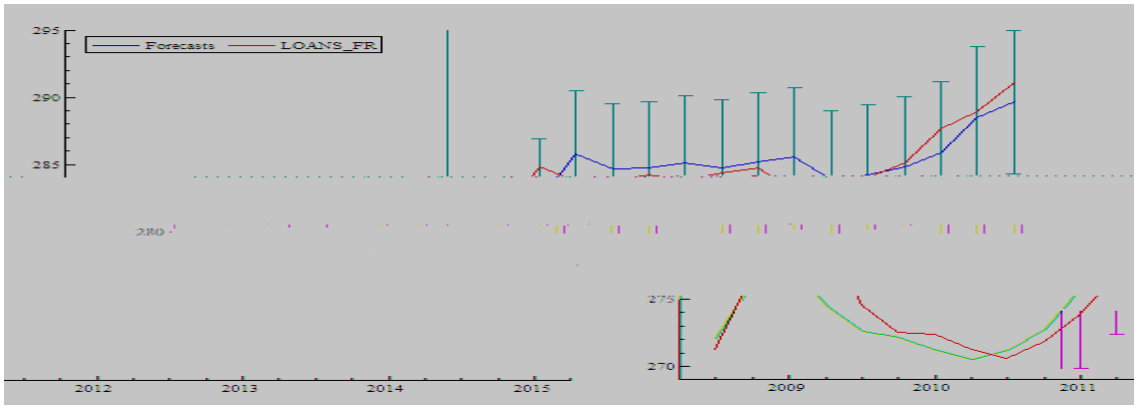


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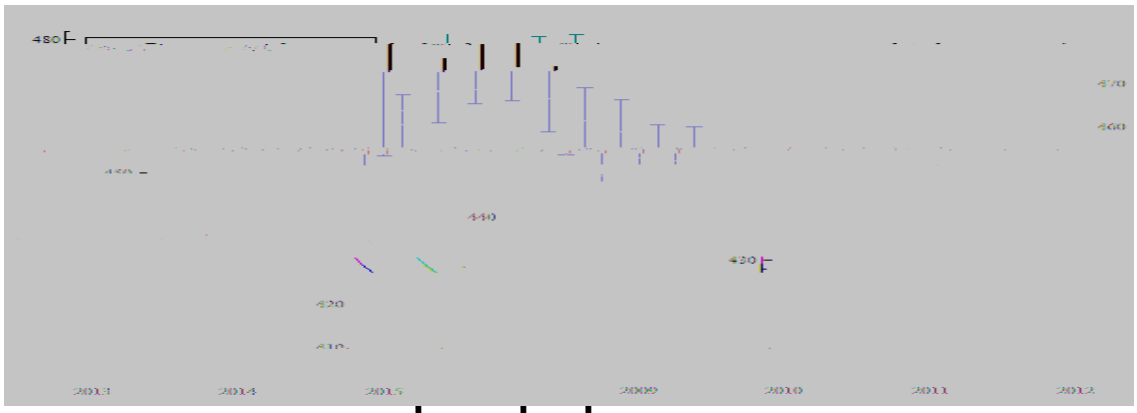

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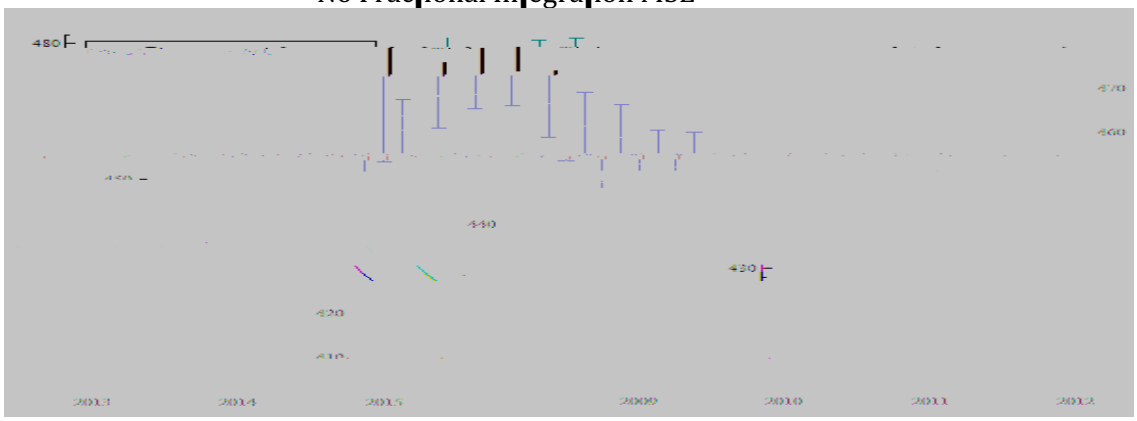

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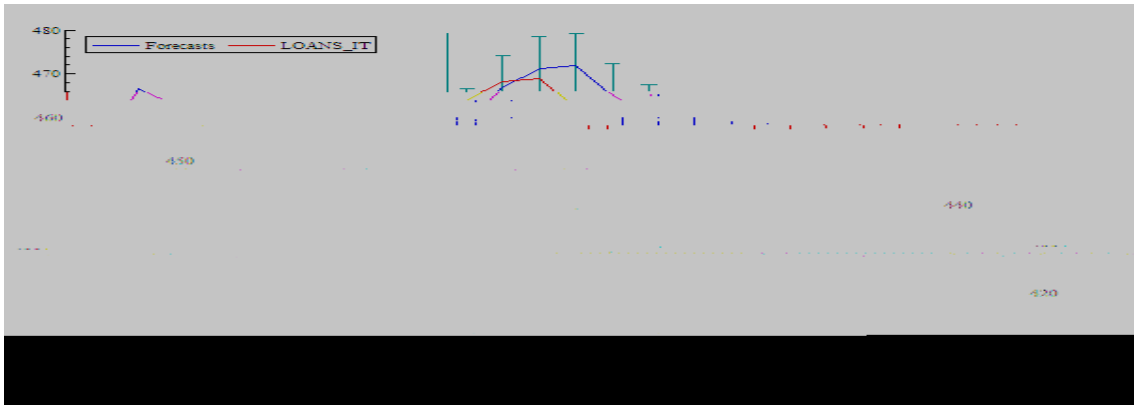


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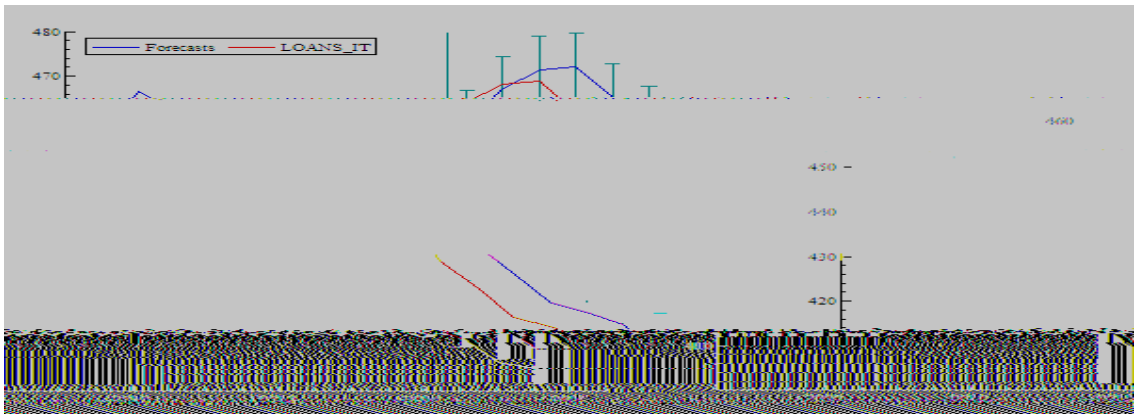


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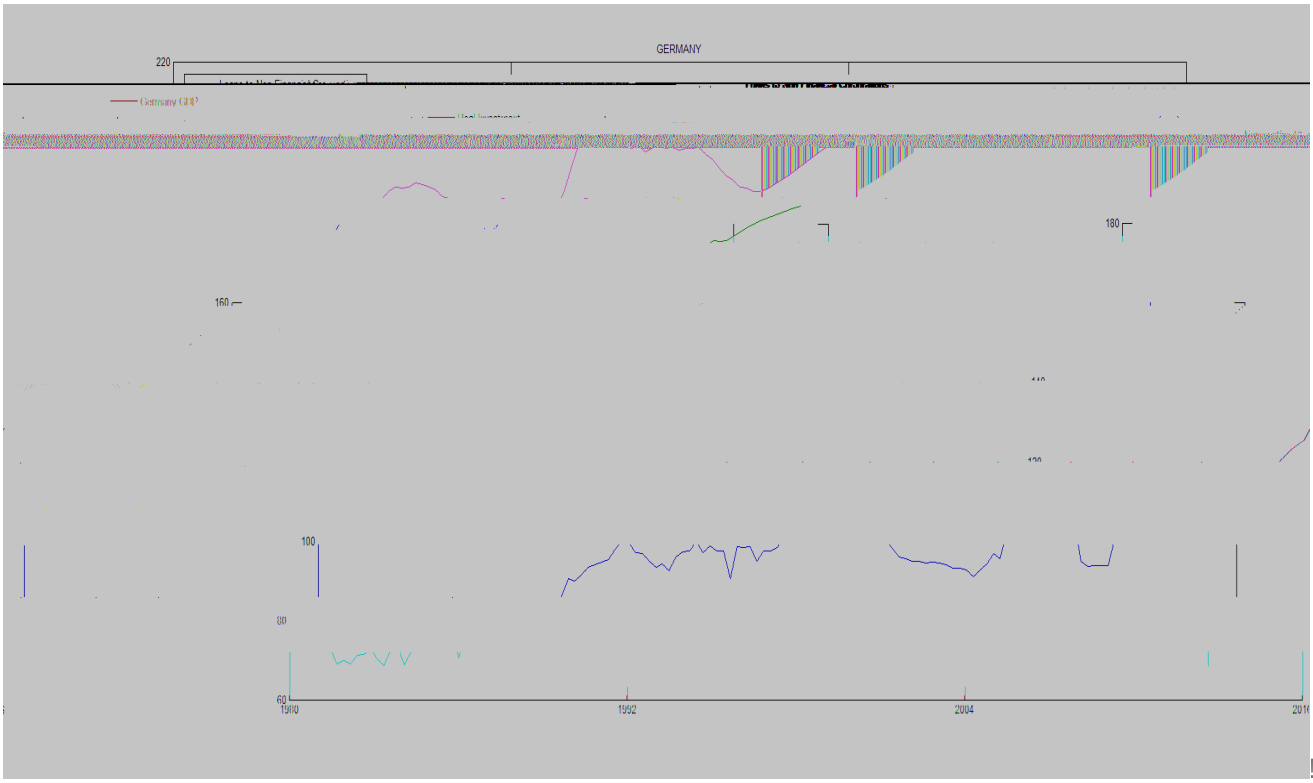


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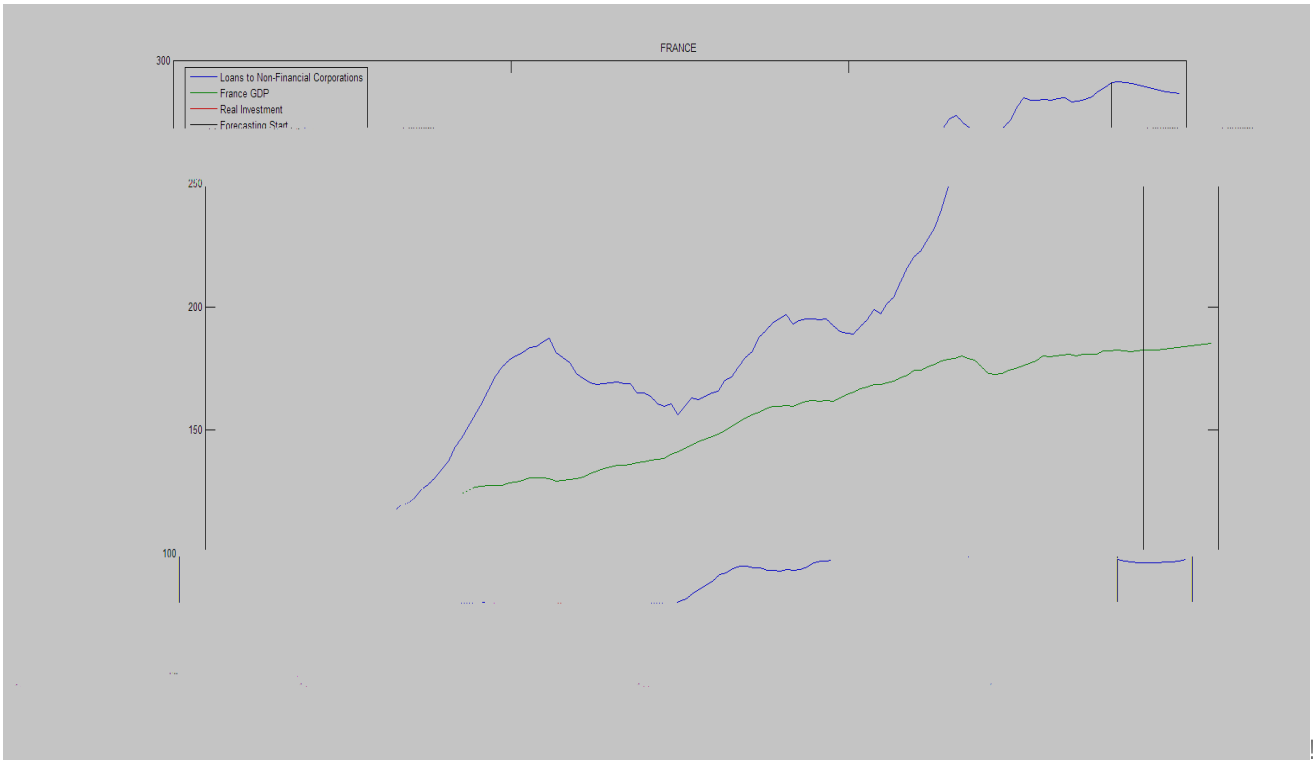


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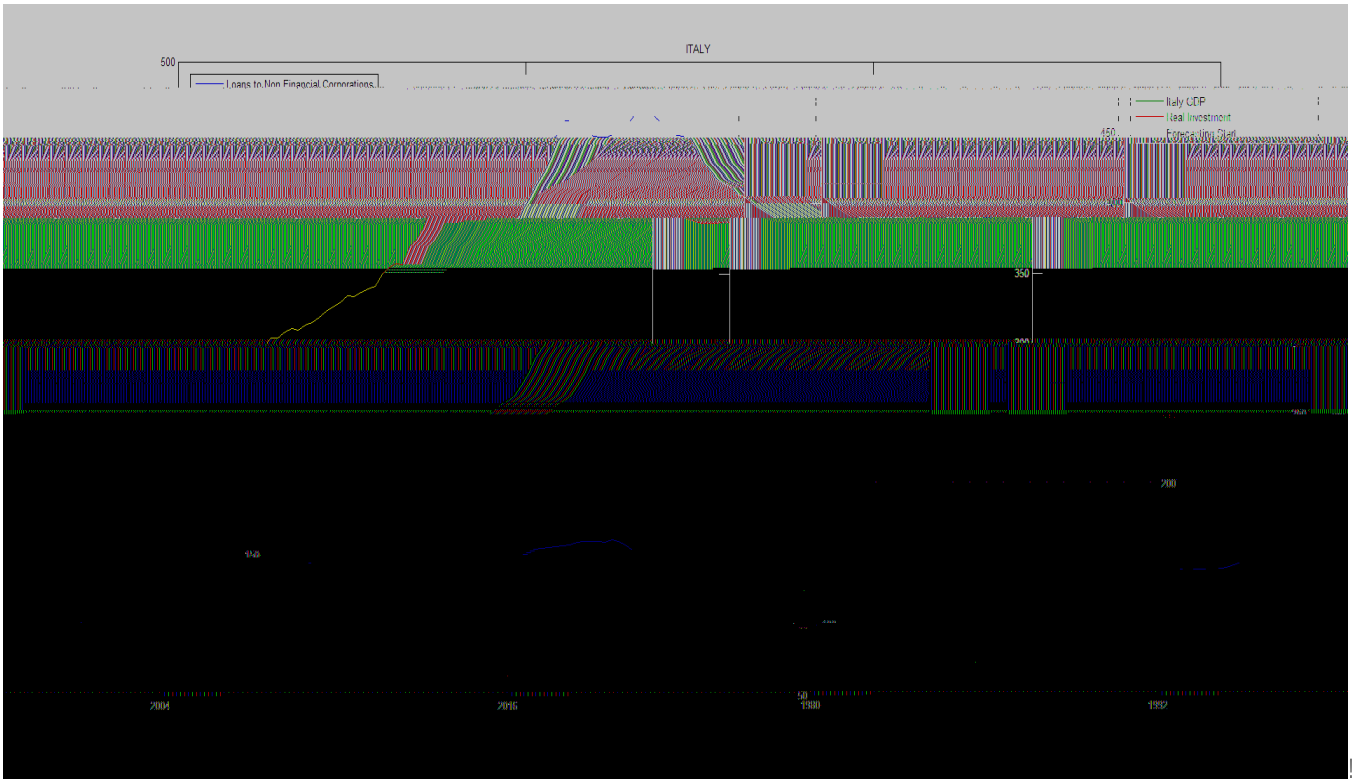
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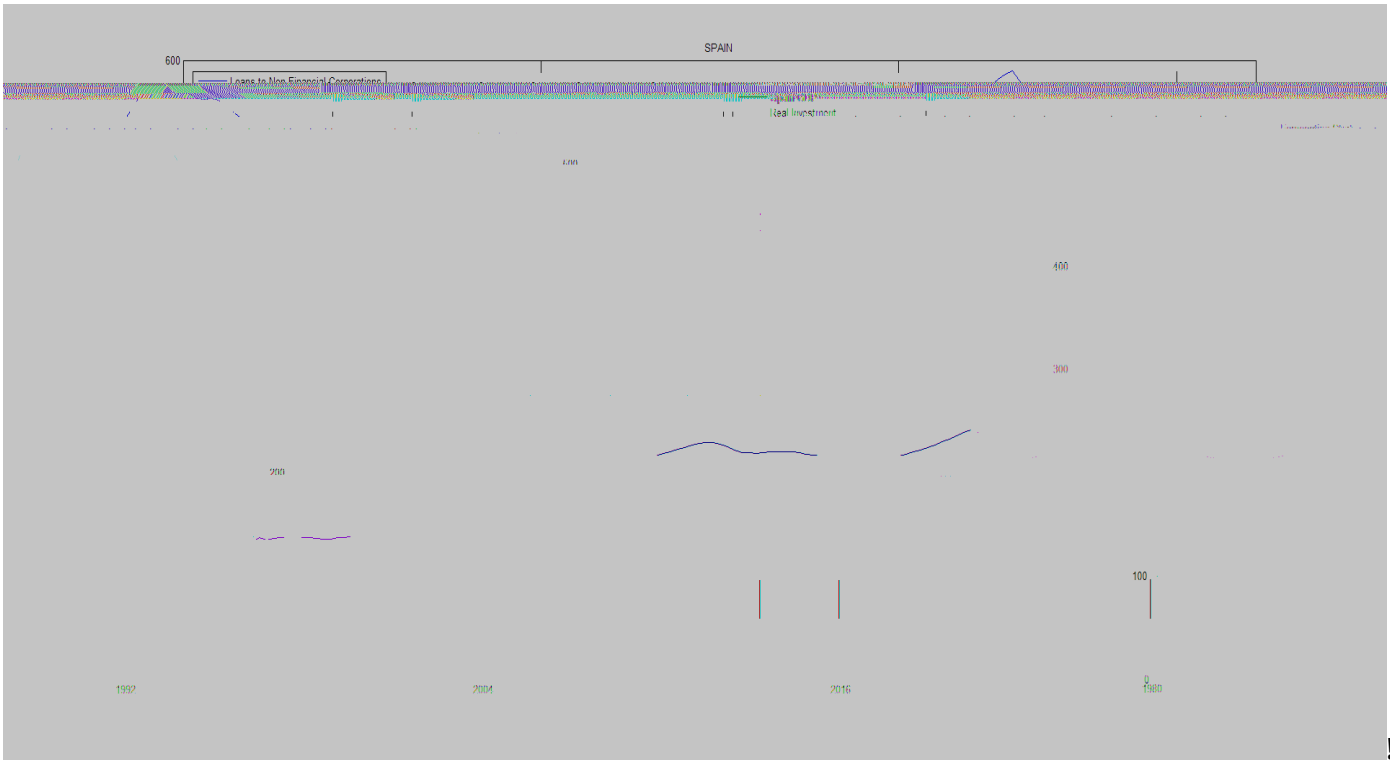
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